SUPER® X10QBi Platform

with

X10QBi Baseboard
AOM-X10QBi-A I/O Module
X10QBi-MEM1 Memory Card

USER'S MANUAL

Revision 1.0

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Manual Revision 1.0

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Preface

This manual is written for system integrators, IT professinals, and knowledgeable PC users. It provides information for the installation and use of the X10QBi platform.

About the X10QBi Platform

The X10QBi Platform consists of the X10QBi baseboard, the AOM-X10QBi-A I/O module, and the X10QBi-MEM1 memory card. The X10QBi baseboard supports up to four Intel E7 series processors that offer Intel QuickPath Interconnect (QPI) Technology with a transfer rate of up to 8.0 GT/s. It also supports up to 6TB DDR3 ECC RDIMM/LRDIMM memory of 1600 MHz (max.) in 96 memory modules on eight memory cards. Combined with Intel® Turbo Boost Technology and support of 60 CPU cores or, with Hyper-Threading, 120 cores, the X10QBi system offers substantially enhanced system performance for High-Performance Cluster system platforms. Please refer to our website at http://www.supermicro.com for processor and memory support updates. This product is intended to be installed and serviced by professional technicians.

Manual Organization

Chapter 1 describes the features, specifications and performance of the X10QBi system, and provides detailed information on the Intel 602J chipset.

Chapter 2 provides hardware installation instructions. Read this chapter when installing the processor, memory modules and other hardware components into the system. If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for video, memory and system setup stored in the CMOS.

Chapter 4 includes an introduction to BIOS and provides detailed information on CMOS setup configuration.

Appendix A provides a list of BIOS error beep codes.

Appendix B details software installation instructions**.**

Appendix C provides UEFI BIOS recovery instructions.

Conventions Used in this Manual

Pay special attention to the following symbols for proper system motherboard installation and to avoid damage done to the system or injury to yourself:

Warning: Important information given to ensure proper system installation or to prevent damage to the components,

Note: Additional information given to provide important information for correct system setup.

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Chapter 1

Overview

1-1 Overview

Checklist

Congratulations on purchasing your computer system from an acknowledged leader in the industry. Supermicro's systems are designed with the utmost attention to detail to provide you with the highest standards in quality and performance.

For more information regarding this product, please visit our website at www.supermicro.com.

Note 1: The X10QBi-A baseboard is intended to be used in conjunction with the AOM-X10QBi-A I/O module, and the X10QBi-MEM1 memory card as an integrated server platform. It is not to be used as a stand-alone product and will not be shipped independently in a retail box.

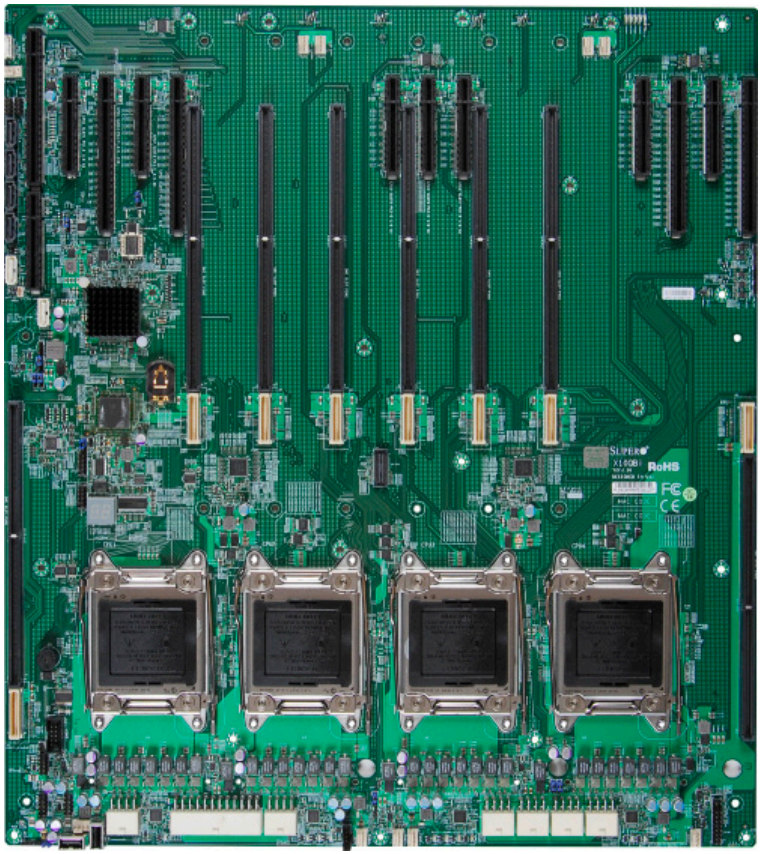
Note 2: For your system to work properly, please follow the links below to download all necessary drivers/utilities and the user's manual for your system.

Supermicro product manuals: http://www.supermicro.com/support/manuals/

Product drivers and utilities: ftp://ftp.supermicro.com/

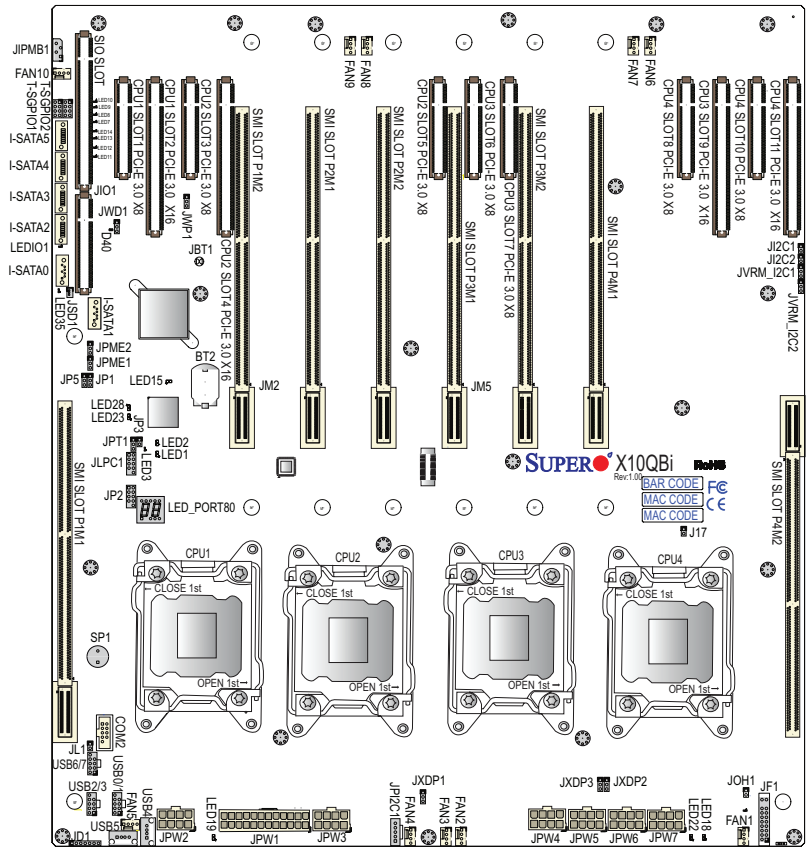
If you have any questions, please contact our support team at support@supermicro.com.

X10QBi Baseboard Image



Note: All graphics shown in this manual were based upon the latest PCB revision available at the time of publishing this manual. The components installed in your system may or may not look exactly the same as the graphics shown in this manual.

X10QBi Baseboard Layout

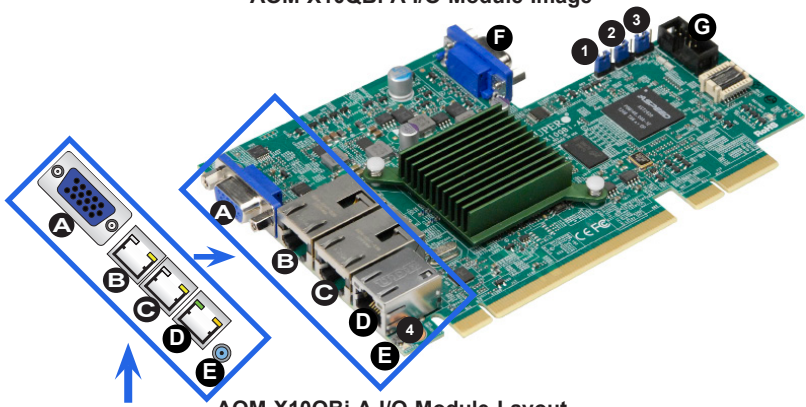


Notes:

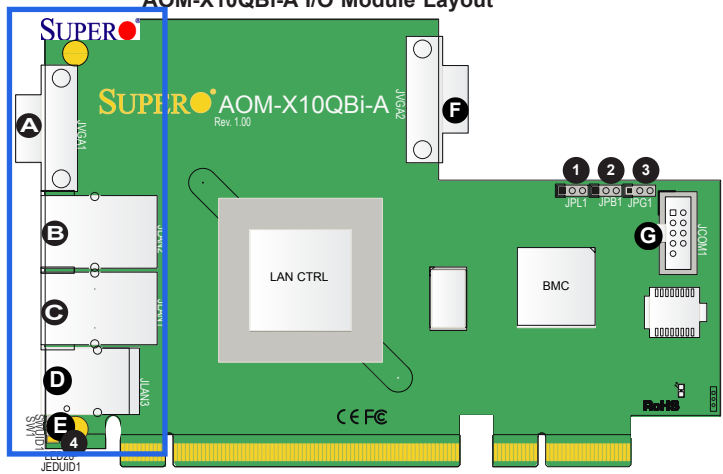
- See Chapter 2 for detailed information on jumpers, I/O ports, and JF1 front panel connections.
- "▪" indicates the location of "Pin 1."
- Jumpers not indicated are for testing only.
- LED Indicators that are not documented are for testing only.

AOM-X10QBi-A I/O Module

AOM-X10QBi-A I/O Module Image



AOM-X10QBi-A I/O Module Layout



AOM-X10QBi-A I/O Module Jumpers/Connectors/LED Indicator

I/O Module Jumpers/LED Indicator

AOM-X10QBi-A I/O Jumpers			
Jumper	**Location**	**Description**	**Default**
JPL1	1	LAN Enabled/Disabled	Pins 1-2 (Enabled)
JPB1	2	BMC Enabled/Disabled	Pins 1-2 (Enabled)
JPG1	3	VGA Enabled/Disabled	Pins 1-2 (Enabled)

AOM-X10QBi-A I/O LED Indicator			
LED	**Location**	**Description**	**State**
LED28	4	UID LED (JEDUID1)	Blue: Unit Identified

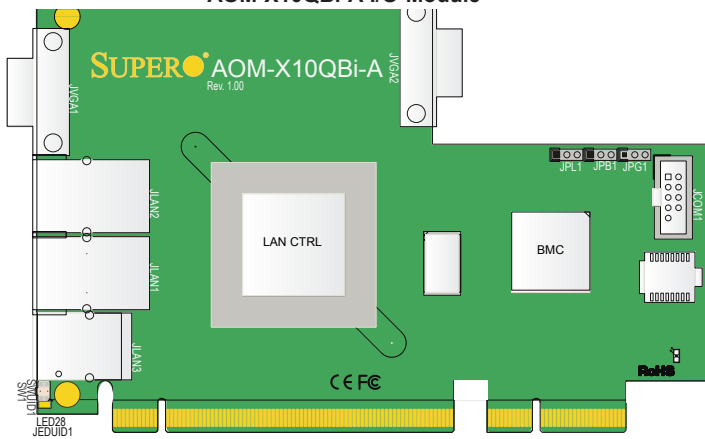
I/O Module Connectors

AOM-X10QBi-A I/O Panel Connectors		
Connector	**Location**	**Description**
JCOM1	G	COM Port
JLAN1	C	LAN Port1
JLAN2	B	LAN Port2
JLAN3	D	LAN Port3
JVG1	A	VGA Port1
JVG2	F	(FP) VGA Port2
SW1	E	UID (Unit Identified) Switch

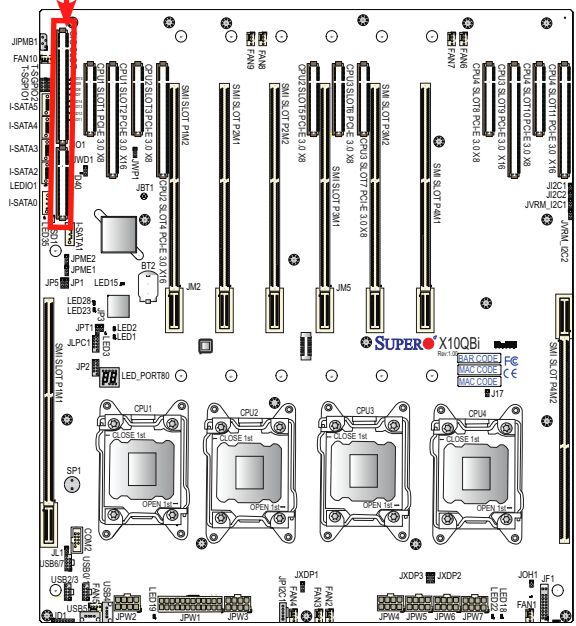
Installing the AOM-X10QBi-A I/O Module on the Baseboard

Note: Before you power on the system, be sure to install the AOM-X10QBi-A I/O module card on the SIO slot as shown in the figure below. Without the I/O module being installed on the motherboard, your system cannot be turned on.

AOM-X10QBi-A I/O Module

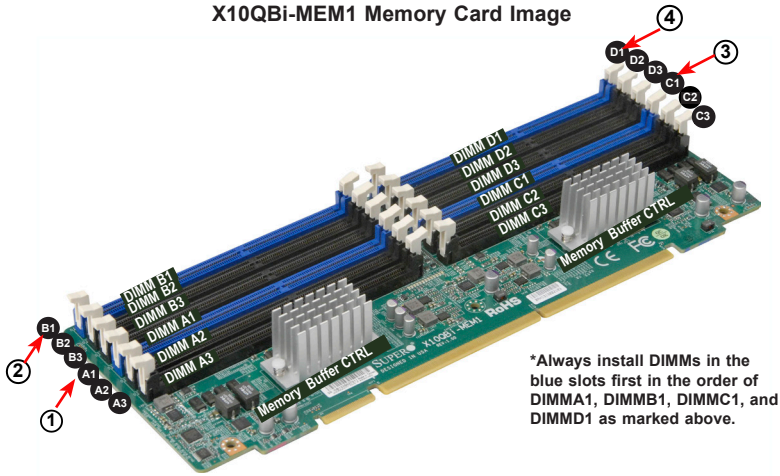


SIO Slot

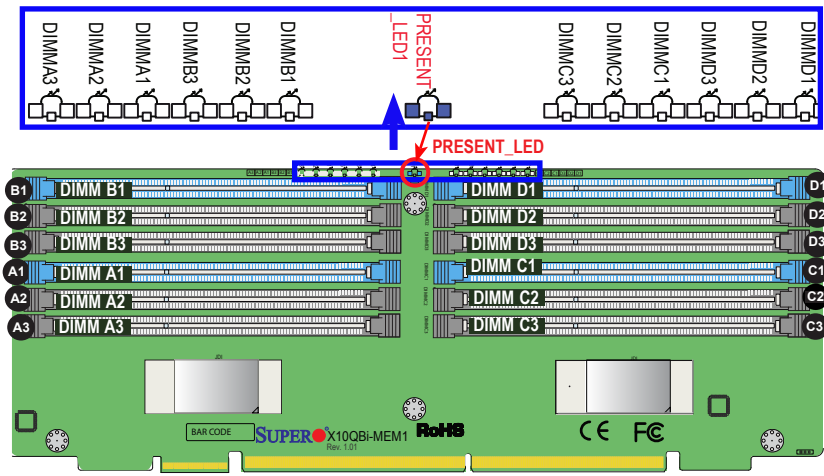


X10QBi-MEM1 Memory Card

X10QBi-MEM1 Memory Card Image



X10QBi-MEM1 Memory Card Layout



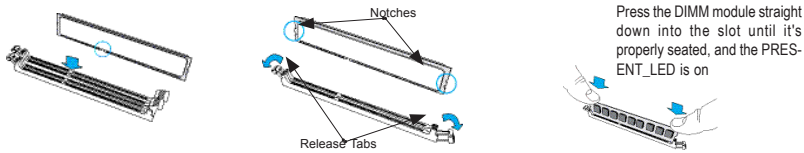
Notes:

1. For proper memory installation on the memory card, please always install DIMM modules in the blue slots first, starting with DIMMA1, DIMMB1, DIMMC1, and DIMMD1 as marked above.

2. When installing a DIMM module, be sure to press the module straight down into the slot until it is properly seated and the PRESENT_LED (as shown above) is on.

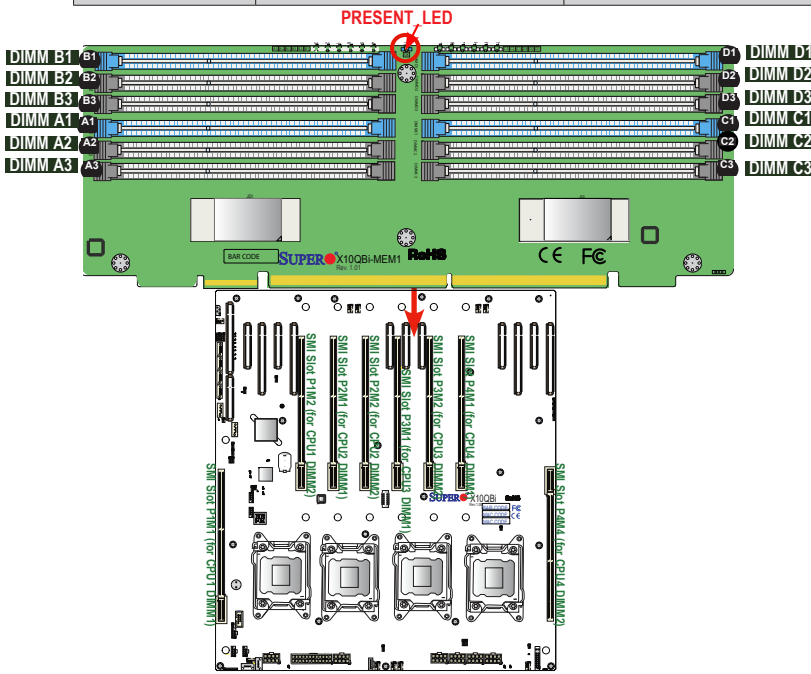
Installing DIMM Modules on the Memory Card and Installing Memory Cards on the Baseboard

1. Install the desired number of DIMMs on a memory card; each card supports up to 12 DIMMs. Press the DIMM module straight down into the slot until it's properly seated, and the PRESENT_LED is on. To install memory, start with the blue slots first in the order of DIMMA1, DIMMB1, DIMMC1, and DIMMD1.

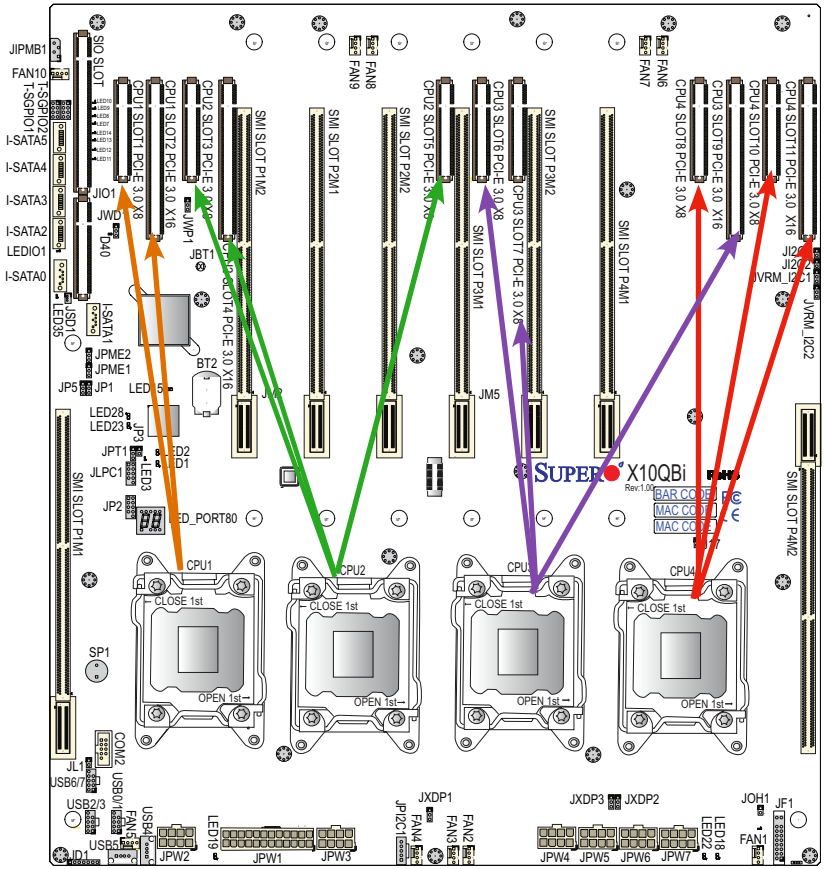


2. After populating DIMMs on the memory cards, follow the table below to Install one or two populated memory cards for each CPU installed on the baseboard. The baseboard has eight slots to accommodate eight memory cards.

CPUs and the Corresponding Memory Cards		
CPU#	**Corresponding DIMM Modules**	
No. of card(s) a CPU	One (1) Memory Card Per CPU	Two (2) Memory Cards Per CPU
CPU 1	SMI Slot P1M1 (Populate this slot first.)	SMI Slot P1M1 + SMI Slot P1M2
CPU 2	SMI Slot P2M1 (Populate this slot first.)	SMI Slot P2M1 + SMI Slot P2M2
CPU 3	SMI Slot P3M1 (Populate this slot first.)	SMI Slot P3M1 + SMI Slot P3M2
CPU 4	SMI Slot P4M1 (Populate this slot first.)	SMI Slot P4M1 + SMI Slot P4M2



X10QBi Baseboard Layout



Note: PCI-E slots and CPUs support auto-switching. Refer to the table below for PCI-E slot support.

PCI-E Expansion Slots
• CPU1 supports Slot1 PCI-E 3.0 x8, and Slot2 PCI-E 3.0 x16
• CPU2 supports Slot3 PCI-E 3.0 x8, Slot4 PCI-E 3.0 x16, and Slot5 PCI-E 3.0 x8
• CPU3 supports Slot6 PCI-E 3.0 x8 Slot7 PCI-E 3.0 x8, and Slot9 PCI-E 3.0 x16
• CPU4 supports Slot8 PCI-E 3.0 x8, Slot10 PCI-E 3.0 x8, and Slot11 PCI-E 3.0 x16

X10QBi Baseboard Quick Reference

X10QBi Jumpers

Jumper	Description	Default Setting
JBT1	Clear CMOS	See Chapter 3
JI²C1/JI²C2	SMB to PCI-E Slots	Pins 2-3 (Disabled)
JPB1 (on the I/O module)	BMC Enabled	Pins 1-2 (Enabled)
JPG1 (on the I/O module)	VGA Enabled	Pins 1-2 (Enabled)
JPME1	ME Mode Recovery	Pins 1-2 (Normal)
JPME2	ME Mode Select	Pins 1-2 (Normal)
JPL1 (on the I/O module)	GLAN1/GLAN2 Enable	Pins 1-2 (Enabled by connecting to the cable)
JPT1	TPM Enabled	Pins 1-2 (Enabled)
JWD1	Watch Dog	Pins 1-2 (Reset)

X10QBi Baseboard Connectors

Connectors	Description
4-pin Fans	4-pin System/Cooling Fan Headers (FAN1-FAN10)
BT2	Onboard Battery (See Chpt. 3 for Battery Disposal)
COM1 (on the I/O module)	Serial/COM Part 1 (located on the AOM-X10QBi-A I/O module)
COM2 (on the mainboard)	Serial/COM Port Header 2
I-SATA 0-5	Intel SATA Connectors 0-5
JD1	Speaker/Power LED Indicator
JF1	Front Panel Control Header
JIPMB1	4-pin External BMC I²C Header (for an IPMI Card)
JL1	Chassis Intrusion
JOH1	Overheat/Fan Fail LED
JPI²C1	Power Supply SMBbus I²C Header
JPW1	ATX 24-pin Power Connector
JPW2-JPW7	8-pin Power Connectors
JSD1	SATA-DOM (Device_on_Module) Power Connector
JVG1/2 (on the I/O module)	VGA/Video Port1/Port2
LAN1/2 (on the I/O module)	G-bit Ethernet Ports 1/2 (JLAN1/JLAN2)
LAN3 (on the I/O module)	BMC LAN (IPMI_Dedicated LAN) (JLAN3)
SP1	Onboard Buzzer/Internal Speaker
T-SGPIO 1/2	Serial_Link General Purpose I/O Headers
USB0/1, USB2/3, USB6/7	Front Panel Accessible USB Connections

USB4, USB5	Type A Front Panel USB Connectors 4/5
UID (on the I/O module)	UID (Unit Identifier) Switch (SWUID1/SW1)
VGA 1/2	Backpanel VGA Port

Note: For the PCI-E slots to work properly, follow the instructions listed on page 1-8.

Warning! To avoid damaging the power supply or the system, and to provide adequate power to the components, be sure to connect the 24-pin power connector and all 8-pin power connectors (JPW2-JPW7) to the power supply. Failure to do so will void the manufacturer warranty.

System Platform Features

System Motherboard (X10QBi)	The X10QBi system motherboard supports up to four Intel® E7 series processors; each processor supports two full-width Intel QuickPath Interconnect (QPI) links (with support of up to 8.0 GT/s Data Transfer Rate in each direction).	
Memory (X10QBi-MEM1 Card)	1. The X10QBi baseboard supports eight memory slots for eight X10QBi-MEM1 memory cards (with two memory cards per CPU-- SMI Slots P1M1/P1M2 for CPU1, SMI Slots P2M1/P2M2 for CPU2, SMI Slots P3M1/P3M2 for CPU3, and SMI Slots P4M1/P4M2 for CPU4). 2. Each X10QBi-MEM1 memory card supports up to 12 modules of DDR3 ECC RDIMM/LRDIMM memory with speeds of up to 1600 MHz. With eight cards installed, the X10QBi platform supports up to 96 memory modules with the total memory size of 6TB supported.	
	• RDIMM / LRDIMM	16GB, 32GB, and 64GB
Chipset	• Intel® Intel 602J PCH	
Expansion Slots (See Page 1-8)	• Four (4) PCI-E 3.0 x16 (Slot2/Slot4/Slot9/Slot11) • Seven (7) PCI E 3.0 x8 (Slot1/Slot3/Slot5/Slot6/ Slot7/ Slot8/Slot10)	
I/O Module Slot	• One (1) SIO Slot for AOM-X10QBi-A module	
Graphics	• ASP2400 BMC Video Controller (Matrox G200eW)	
Network	• One Intel Gigabit Ethernet Dual-Channel Controller for LAN 1/LAN 2 ports. • One IPMI LAN 2.0 port supported by the BMC	
I/O Devices	**SATA Connections**	
	• SATA	Six (6) SATA Ports I-SATA0-5
	• RAID (Windows)	RAID 0, 1, 5, 10
	Integrated IPMI 2.0	
	• IPMI 2.0 supported by the ASP2400 BMC	
	Serial (COM) Port	

	• One (1) Fast UART 16550 Connection on the AOM-X10QBi-A I/O module for backpanel support • One Front Accessible Serial Header located on the X10QBi system board
	Baseboard Controller
	• ASP2400
Peripheral Devices	**USB Devices**
	• Three (3) USB Headers with six connections (USB 0/1, USB 2/3, USB 6/7)
	• Two (2) Type A internal connector (USB 4/5)
BIOS	• 16 MB AMI BIOS® UEFI EEPROM Flash BIOS
	• APM 1.2, PCI 2.3, ACPI 1.0/2.0/3.0, USB Keyboard, Plug & Play (PnP), and SMBIOS 2.5
Power	• One (1) 24-pin ATX Main Power Supply Connector (JPW1) • Six (6) 8-pin Power Connectors (JPW2-JPW7), • One (1) SATA DOM Power Connection (JSD1) **Note:** All of these power connections are required for adequate power supply for the components and the system.
	• ACPI/ACPM Power Management
Config.	• Main switch override mechanism
	• Power-on mode for AC power recovery
	• Intel® Intelligent Power Node Manager (Available when the NMView utility is installed in the system)
	• Manageability Engine
PC Health Monitoring	**CPU Monitoring**
	Onboard voltage monitors for CPU Vcore (up to 4 CPU cores), 3.3VDD, 3.3VSB, 12V, 5V, Memory Voltage, and Battery Voltage.
	• CPU 7-Phase switching voltage regulator
	• CPU/System overheat LED and control
	• CPU Thermal Trip support
	• Thermal Monitor 2 (TM2) support
	Fan Control

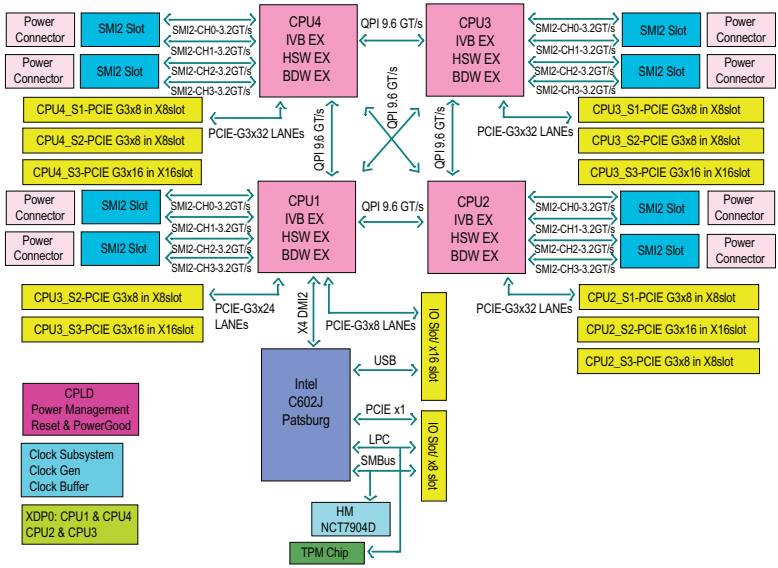
	• Ten (10) 4-pin system cooling fans with fan status monitoring with firmware (Pulse Width Modulation) fan speed control and low noise fan speed control)
System Management	• PECI (Platform Environment Configuration Interface) 2.0 support
	• System resource alert via SuperDoctor® III
	• SuperDoctor III, Watch Dog, NMI
	• Chassis Intrusion Header and Detection
Dimensions	• 19.0" (L) x 17.0" (W) (482.60mm x 431.80 mm) (X10QBi system motherboard)

Notes:

1. For IPMI configuration Instructions, please refer to the "Embedded IPMI Configuration User's Guide" available @ http://www.supermicro.com/support/manuals/.

2. For PCI-E expansion slots to work properly, please refer to the instructions listed on page 1-8.

X10QBi System Block Diagram



System Block Diagram

Note: This is a general block diagram and may not exactly represent the features on your system motherboard. See the "System Platform Features "pages for the actual specifications of the system.

1-2 Processor/PCH Platform Overview

Built upon the functionality and capability of the Intel E7 series processor(s) and the 602J PCH, the X10QBi system provides support for quad-processor-based HPC/Cluster/Database server platforms.

With the Intel QuickPath interconnect (QPI) controller built in, the E7 series processor offers a point-to-point system interconnect interface, greatly enhancing system performance by utilizing serial link interconnections, which allows for increased bandwidth and scalability.

The 602J PCH provides an Interface between the QPI-based processor and PCI-Express components. Each processor supports full-width, bidirectional interconnects at the speeds of 6.4 GT/s, 7.2 GT/s, and 8.0 GT/s. Each QPI link consists of 20 pairs of unidirectional differential lanes for data transmission in addition to a differential forwarding clock. The x16 PCI Express Gen 3 connections can also be configured as x8, x4, and x2 links to comply with the PCI-E Base Specification, Rev. 2.0. These PCI-E Gen 3 lanes support peer-to-peer read-and-write transactions.

The 602J PCH also offers a wide range of ESI, Intel® I/OAT Gen 3, Intel VT-d, and RAS (Reliability, Availability and Serviceability) support. The features supported include memory interface ECC, x4/x8 Single Device Data Correction (SDDC), Flow-through CRC (Cyclic Redundancy Check), parity protection, out-of-band register access via the SMBus, and memory mirroring for data integrity.

Main Features of the 602J PCH Chip

- Full-connectivity (with four Intel® QuickPath Interconnects and up to ten cores in each socket with 24MB of shared last level (L3) cache supported)
- CPU-integrated memory controller with support of DDR-3 1600 MHz RDIMM/LRDIMM modules
- Virtualization Technology
- 44-bit physical address and 48-bit virtual address supported

1-3 Special Features

Recovery from AC Power Loss

Basic I/O System (BIOS) provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must press the power switch to turn it back on), or for the system to automatically return to a power-on state. See the Advanced BIOS Setup section to change this setting. The default setting is **Last State**.

1-4 PC Health Monitoring

This section describes the PC health monitoring features of the board. This platform has five onboard system hardware monitor chips that provide PC health monitoring. An onboard voltage monitor will scan the onboard voltages continuously: CPU vcore (up to 4 CPU cores), 3.3VSB, P3V3, 12V, 5V, memory voltage, and battery voltage. If a voltage becomes unstable, a warning is given or an error message is sent to the screen. The user can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware Control

PC health monitoring in the BIOS can check the RPM status of the cooling fans. The onboard CPU and chassis fans are controlled by the IPMI interface.

Environmental Temperature Control

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. Once the thermal sensor detects that the CPU temperature is too high, it will automatically turn on the thermal fans to prevent the CPU from overheating. The onboard chassis thermal circuitry can monitor the overall system temperature and alert the user when the chassis temperature is too high.

Note: To avoid possible system overheating, please be sure to provide adequate airflow to your system.

System Resource Alert

This feature is available when the system is used with SuperDoctor III in Windows OS or with SuperDoctor II in Linux. SuperDoctor is used to notify the user of

certain system events.

1-5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including the hardware, operating system, and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives, and printers.

In addition to enabling operating-system-directed power management, ACPI also provides a generic system event mechanism for Plug-and-Play, and an operating-system-independent interface for configuration control. ACPI leverages the Plug-and-Play BIOS data structures, while providing a processor architecture-independent implementation that is compatible with Windows 2008 and newer operating systems.

1-6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. This is even more important for processors that have high CPU clock rates.

The X10QBi system motherboard includes a 24-pin ATX main system power connector (JWP1), six 8-pin power connectors (JWP2-JPW7), and a SATA DOM power connector (JWF1). Please connect these power connectors to the power supply to provide adequate power to the components and the system.

Warning! To avoid damaging the power supply or the system, be sure to connect the 24-pin ATX Main Power connector (JPW1), six 8-pin power connectors (JPW2-7), and the SATA DOM power connector (JSD1) to the power supply. Failure to do so will void the manufacturer warranties on both your power supply and the board.

It is strongly recommended that you use a high-quality power supply that meets ATX Power Supply Specification 2.02 or above. It must also be SSI compliant. (For more information, please refer to the website at http://www.ssiforum.org/.) Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

1-7 Super I/O

The Super I/O provides functions that comply with the ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power

management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

1-8 Advanced Power Management

The new advanced power management features supported by the motherboard includes the following:

Intel® Intelligent Power Node Manager (NM) (Available when the NMView utility is installed in the system)

The Intel® Intelligent Power Node Manager (IPNM) provides your system with real-time thermal control and power management for maximum energy efficiency. Although IPNM Specification Version 1.5/20 is supported by the BMC (Baseboard Management Controller), your system must also have IPNM-compatible Management Engine (ME) firmware installed to use this feature.

Note: Support for IPNM Specification Version 1.5 or Version 2.0 depends on the power supply used in the system.

Management Engine (ME)

The Management Engine, which is an ARC controller embedded in the PCH, provides Server Platform Services (SPS) to your system. The services provided by SPS are different from those provided by the ME on client platforms.

Chapter 2

Installation

2-1 Standardized Warning Statements

The following statements are industry-standard warnings, provided to warn the user of situations which have the potential for bodily injury. Should you have questions or experience difficulty, contact Supermicro's Technical Support department for assistance. Only certified technicians should attempt to install or configure components.

Read this section in its entirety before installing or configuring components in the Supermicro chassis.

Battery Handling

Warning!

There is a danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

電池の取り扱い

電池交換が正しく行われなかった場合、破裂の危険性があります。交換する電池はメーカーが推奨する型、または同等のものを使用下さい。使用済電池は製造元の指示に従って処分して下さい。

警告
电池更换不当会有爆炸危险。请只使用同类电池或制造商推荐的功能相当的电池更换原有电池。请按制造商的说明处理废旧电池。

警告
電池更換不當會有爆炸危險。請使用製造商建議之相同或功能相當的電池更換原有電池。請按照製造商的說明指示處理廢棄舊電池。

Warnung

Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

Attention

Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

¡Advertencia!

Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

אזהרה !

קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף את הסוללה בסוג התואם מחברת יצרן מומלצת.

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار في حالة استبدال البطارية بطريقة غير صحيحة فعليك
استبدال البطارية
فقط بنفس النوع أو ما يعادلها كما أوصت به الشركة المصنعة
تخلص من البطاريات المستعملة وفقا لتعليمات الشركة الصانعة

경고!

배터리가 올바르게 교체되지 않으면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조사에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조사의 안내에 따라 사용된 배터리를 처리하여 주십시오.

Waarschuwing

Er is ontploffingsgevaar indien de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type die door de fabrikant aanbevolen wordt. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften afgevoerd te worden.

Product Disposal

Warning!

Ultimate disposal of this product should be handled according to all national laws and regulations.

製品の廃棄

この製品を廃棄処分する場合、国の関係する全ての法律・条例に従い処理する必要があります。

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

¡Advertencia!

Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.

Attention

La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

סילוק המוצר

אזהרה !

סילוק סופי של מוצר זה חייב להיות בהתאם להנחיות וחוקי המדינה.

عند التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القوانين واللوائح الوطنية

경고!

이 제품은 해당 국가의 관련 법규 및 규정에 따라 폐기되어야 합니다.

Waarschuwing

De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.

2-2 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To avoid damaging your system, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules, or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the system motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure that your system chassis provides excellent conductivity between the power supply, the case, the mounting fasteners, and the system motherboard.
- Use only the correct type of onboard CMOS battery as specified by the manufacturer. To avoid possible explosion, do not install the onboard battery upside down.

Unpacking

The system board is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static-protected.

2-3 Processor and Heatsink Installation

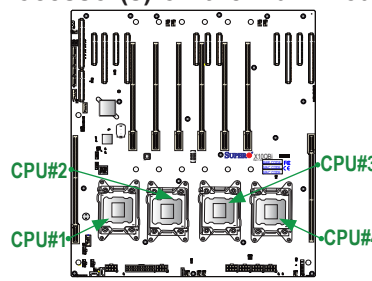
Warning: When handling the processor package, avoid placing direct pressure on the label area.

Notes:

- Always connect the power cord last, and always remove it before adding, removing, or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.
- If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.
- Make sure to install the motherboard into the chassis before you install the CPU heatsink.
- When receiving a motherboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and that none of the socket pins are bent; otherwise, contact your retailer immediately. Refer to the Supermicro website for updates on CPU support.

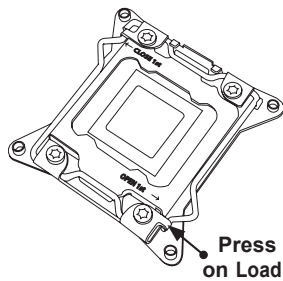
Installing the E7-4800V2 Processor(s) on the Main Board

Note: There are four CPU sockets located on the X10QBi baseboard. Populate the desired number of CPUs on the board starting with CPU Socket 1 as shown in the figure on the right.



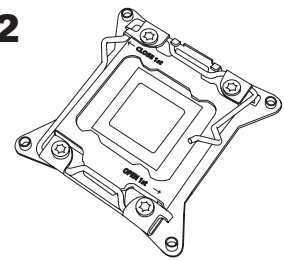
1. There are two load levers on the E-7-4800V2 socket. To open the socket cover, first press and release the load lever labeled 'Open 1st'.

1

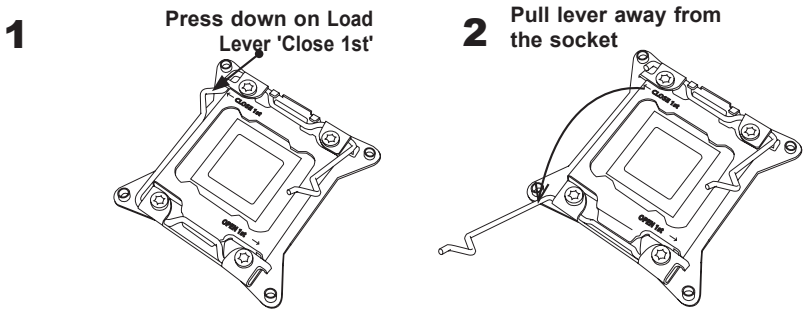


Press down on Load Lever labeled 'Open 1st'.

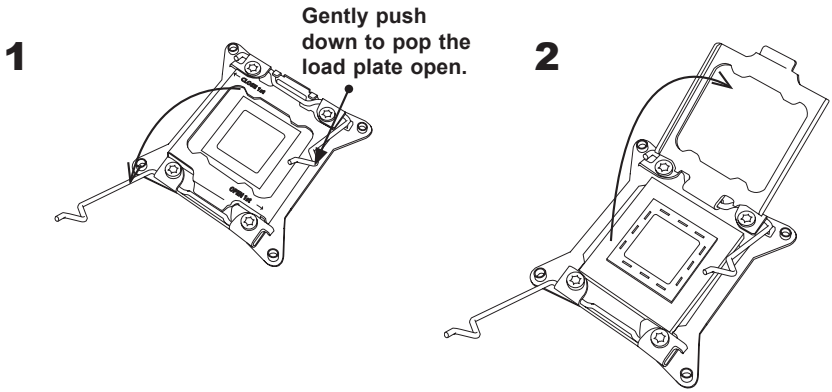
2



1. Press the second load lever labeled 'Close 1st' to release the load plate that covers the CPU socket from its locking position.

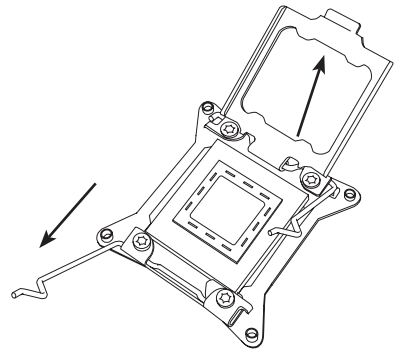


2. With the lever labeled 'Close 1st' fully retracted, gently push down on the lever labelled 'Open 1st' to open the load plate. Lift the load plate to open it completely.

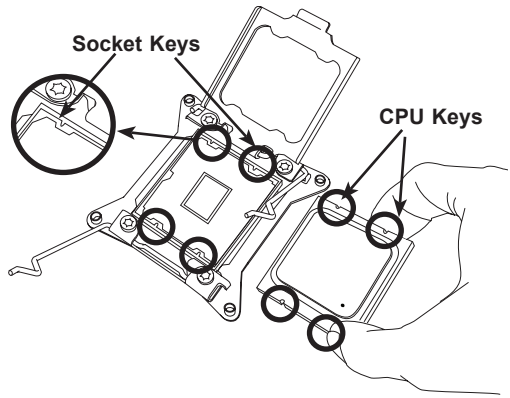


Note: All graphics shown in this manual were based upon the latest PCB revision available at the time of publishing this manual. The components installed in your system may or may not look exactly the same as the graphics shown in this manual.

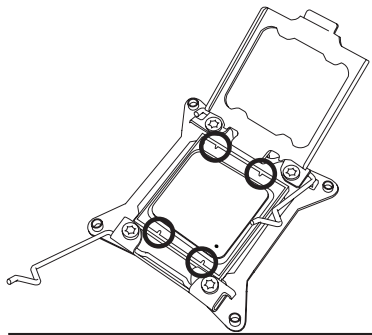
1. Use your thumb and the index finger to loosen the lever and open the load plate.



2. Using your thumb and index finger, hold the CPU on its edges. Align the CPU keys, which are semi-circle cutouts, against the socket keys.



3. Once they are aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface or against any pins of the socket to avoid damaging the CPU or the socket.)

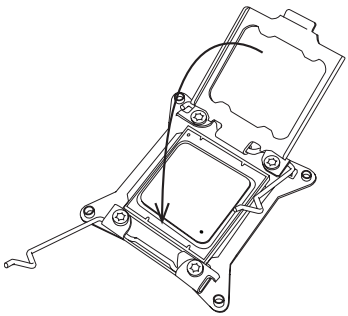


Warning: You can only install the CPU inside the socket in one direction. Make sure that it is properly inserted into the CPU socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again to make sure that the CPU is aligned properly.

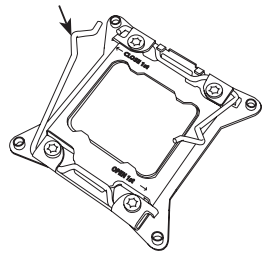
1. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.

2. Close the load plate with the CPU inside the socket. Lock the lever labeled 'Close 1st' first, then lock the lever labeled 'Open 1st' second. Using your thumb gently push the load levers down to the lever locks.

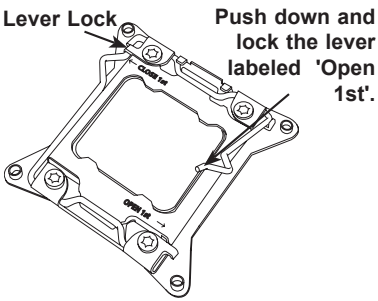
1 **Gently close the load plate.**



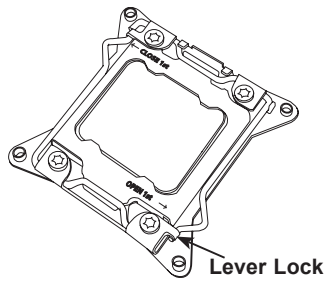
2 **Push down and lock the lever labeled 'Close 1st'.**



3



4



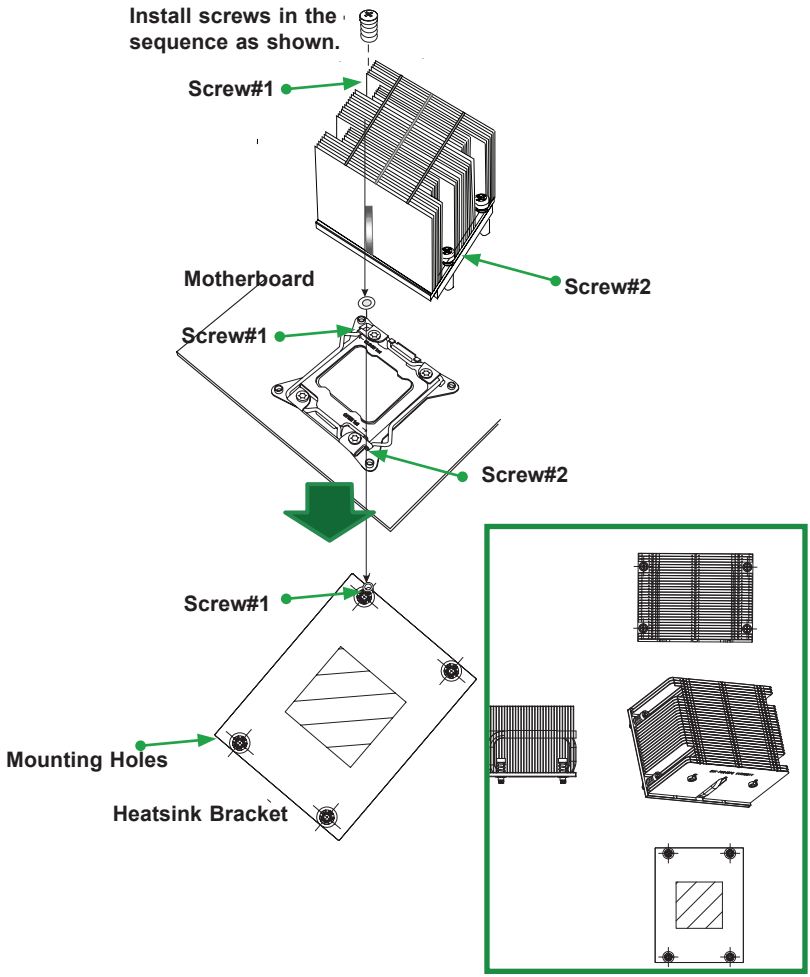
Installing a Passive CPU Heatsink

1. Do not apply thermal grease to the heatsink or the CPU die; the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the motherboard and the underlying heatsink bracket.

3. Screw in two diagonal screws (the #1 and #2 screws in the figure below) until just snug. To avoid possible damage to the CPU, do not over tighten the screws.

4. Finish the installation by fully tightening all four screws.



Removing the Heatsink

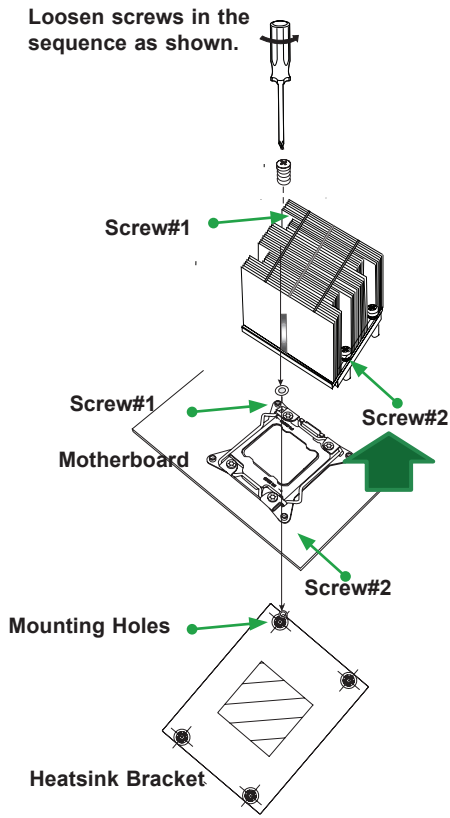
Warning: We do not recommend that the CPU or heatsink be removed. However, if you do need to uninstall the heatsink, please follow the instructions below to remove the heatsink to avoid damaging the CPU or CPU socket.

1. Unscrew the heatsink screws from the motherboard in the sequence as shown in the figure below.

2. Gently wiggle the heatsink to loosen it from the CPU. (Do not use excessive force.)

3. Once the CPU is loosened, remove the CPU from the CPU socket.

4. Clean the surface of the CPU and the heatsink, removing any thermal grease. Reapply the proper amount of fresh thermal grease on the surface before reinstalling the CPU and the heatsink.

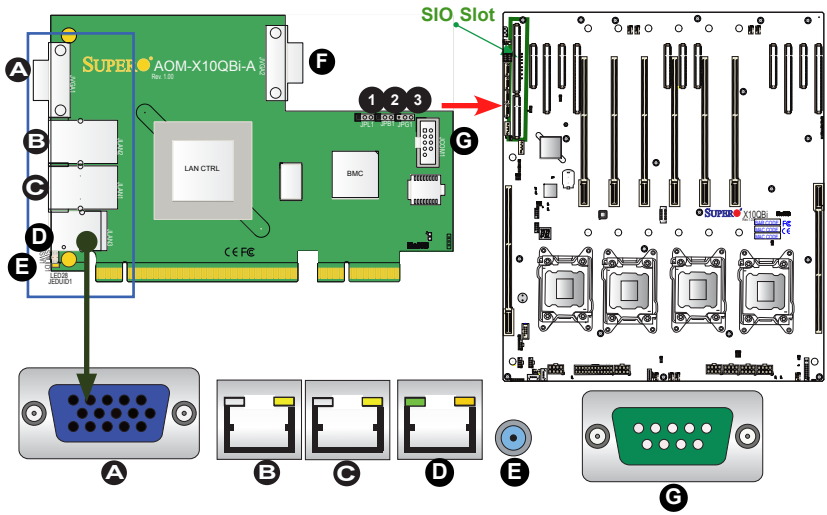


2-4 I/O Module and Memory Card Installation

Installing the AOM-X10QBi-A I/O Module on the Mainboard

Note: After you've installed the CPUs and heatsinks on the baseboard, be sure to install the AOM-X10QBi-A I/O module card on the SIO slot as shown on the figure below before you power on the system. Without the I/O module being installed on the motherboard, your system cannot be turned on.

AOM-X10QBi-A I/O Module



I/O Port Locations and Definitions

A. JVGA1: VGA/Video Connector 1
B. JLAN2: LAN Port2
C. JLAN1: LAN Port1
D. JLAN3: (BMC) IPMI_LAN
E. UID (Unit Identifier) Switch & UID LED (Blue: Unit Identified)
F. JVGA2: VGA/Video Connector 2
G. JCOM1: COM Connection 1

Jumpers

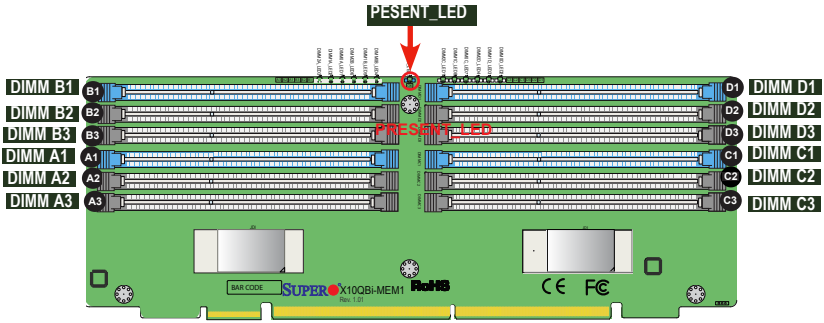
1. JPL1: LAN Enable/Disable (Default: Pins 1-2: Enabled)
2. JPB1: BMC Enable/Disable (Default: Pins 1-2: Enabled)
3. JPG1: VGA Enable/Disable (Default: Pins 1-2: Enabled)

Installing DIMM Modules on the X10QBi Memory Card

CAUTION

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Check Supermicro's website for recommended memory modules.

1. Install the desired number of DIMM modules on a memory card; each card supports up to 12 DIMMs. When installing memory, be sure to always populate the blue slots first, starting with DIMMA1, DIMMB1, DIMMC1, and DIMMD1. For best performance, please use the memory modules of the same type and same speed in the same bank.

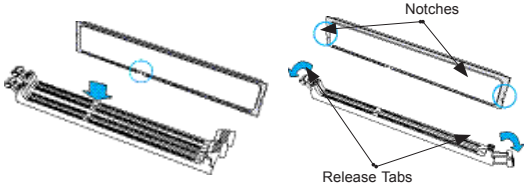


2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.

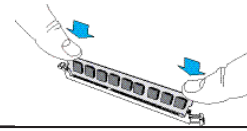
3. Align the key of the DIMM module with the receptive point on the memory slot.

4. Align the notches on both ends of the module with the receptive points on the ends of the slot. Use two thumbs together to press module straight down into the slot until the module snaps into place and the PRESENT_LED (as shown above) is on.

5. Press the release tabs to the lock positions to lock the DIMM module into the slot



Note: Press the memory straight down into the slot until it is properly seated, and the Present_LED is on. Be sure to always populate the blue slots first, starting with DIMMA1, DIMMB1, DIMMC1, and then DIMMD1.

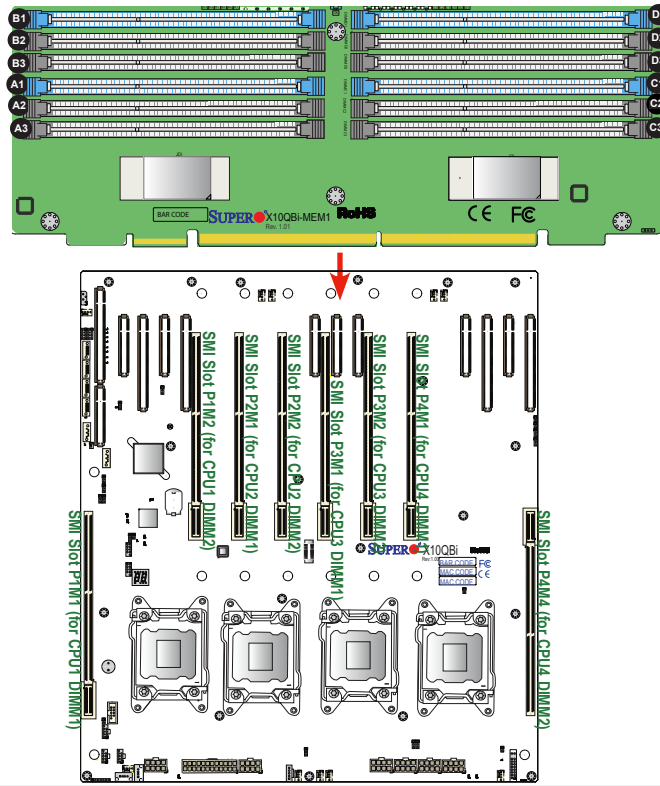


Installing Populated X10QBi Memory Cards on the Baseboard

1. After the memory card is populated with the desired number of RDIMM/ LRDIMM modules, it is ready to be installed on the baseboard.

2. Install one or two memory cards for each CPU installed on the baseboard, starting with SMI Slot P1M1. The X10QBi baseboard supports up to four processors. Refer to the table below to install memory cards that are populated with DIMM modules to the X10QBi baseboard.

CPUs and the Corresponding Memory Cards		
CPU#	**Corresponding DIMM Modules**	
No. of card(s) for Each CPU	One (1) Memory Card for each CPU Installed (-populate this slot first--)	Two (2) Memory Cards for each CPU Installed
CPU 1	SMI Slot P1M1	SMI Slot P1M1 + SMI Slot P1M2
CPU 2	SMI Slot P2M1	SMI Slot P2M1 + SMI Slot P2M2
CPU 3	SMI Slot P3M1	SMI Slot P3M1 + SMI Slot P3M2
CPU 4	SMI Slot P4M1	SMI Slot P4M1 + SMI Slot P4M2



Removing the X10QBi Memory Card from the Baseboard

Be sure to remove a memory card from the baseboard before you remove the RDIMM/LRDIMM modules from the memory card. To remove memory cards from the baseboard, follow the reverse sequence of memory card installation as shown on the memory population table on the previous page.

Removing RDIMM/LRDIMM Memory Modules from the X10QBi Memory Card

Press both notches on the ends of each DIMM module to unlock it. Once the DIMM module is loosened, remove it from the memory slot.

2-5 Installing the System Motherboard into the Chassis

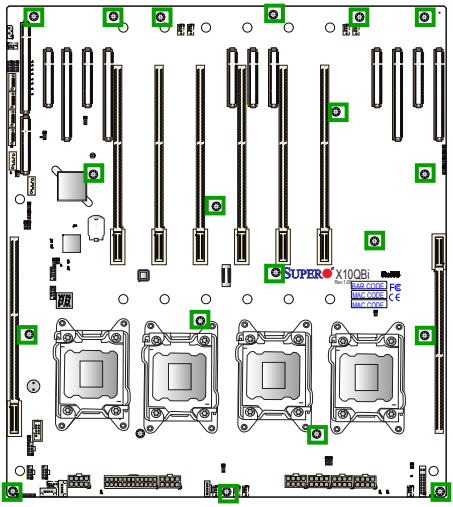
Follow the instructions below to install the system motherboard into the chassis.

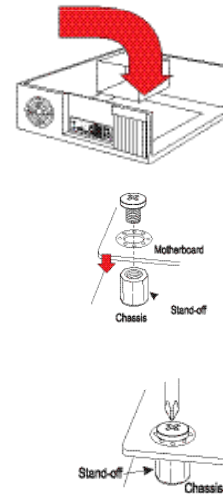
Tools Needed

- Phillips Screwdriver
- Pan_head #6 screws (19 pieces)
- Standoffs (19 pieces, if needed)

1. Install the I/O shield into the chassis.

2. Locate the mounting holes on the system system board and the matching mounting holes on the chassis.





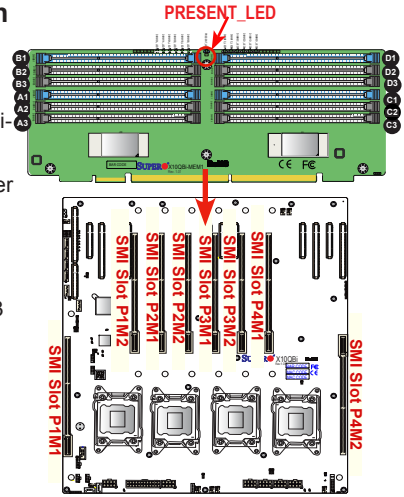
3. Place the system board into the chassis, making sure that the mounting holes on the system board match the corresponding mounting holes on the chassis.

4. Install standoffs in the chassis as needed.

5. Using the Phillips screwdriver, insert a pan head #6 screw into a mounting hole on the system board and its matching mounting hole on the chassis. Repeat this step for other mounting holes to secure the system board to the chassis.

2-6 Memory Support for the X10QBi Platform

Installing Memory Cards on the Baseboard



1. The X10QBi baseboard supports eight memory slots for eight X10QBi-MEM1 memory cards with two memory cards per CPU. Please refer the table below.

2. Each X10QBi-MEM1 memory card supports up to 12 modules of DDR3 ECC RDIMM/LRDIMM memory of up to 1600 MHz. With eight cards installed on the baseboard, the X10QBi supports up to 96 modules with a total size of 6TB supported.

3. When installing a DIMM module on a memory card, be sure to press the module straight down into the slot until it is properly seated and the PRESENT_LED is on. Also, be sure to always install the DIMM modules in the blue slots first, starting with DIMMA1/DIMMB1/DIMMC1/DIMMD1.

Installing Memory Cards to the Baseboard

After populating DIMMs on the memory cards, follow the table below to install the memory cards that are populated with DIMM modules on the baseboard:

CPUs and the Corresponding Memory Cards		
CPU#	**Corresponding DIMM Modules**	
No. of card(s) for Each CPU	One (1) Memory Card for each CPU Installed on the baseboard	Two (2) Memory Cards for each CPU Installed on the baseboard
CPU 1	SMI Slot P1M1 (-populate this slot first-)	SMI Slot P1M1 + SMI Slot P1M2
CPU 2	SMI Slot P2M1 (-populate this slot first-)	SMI Slot P2M1 + SMI Slot P2M2
CPU 3	SMI Slot P3M1 (-populate this slot first-)	SMI Slot P3M1 + SMI Slot P3M2
CPU 4	SMI Slot P4M1 (-populate this slot first-)	SMI Slot P4M1 + SMI Slot P4M2

Note 1: For proper memory installation on the memory card, please always populate the blue slots first, starting with DIMMA1,DIMM B1, DIMMC1 and then DIMMD1.

Note 2: To optimize system performance, we recommend that the 4-CPU configuration be used in your system (either with full-loading of 96 memory modules installed or half-loading with 48 modules installed.) Please also note that the 1-CPU configuration has not been validated by Supermicro.

Populating RDIMM/LRDIMM (ECC) Memory Modules

Intel E7 Series Processor RDIMM and LRDIMM Memory Configuration for Performance Mode (2:1)

Type	Ranks Per DIMM & Data Width	Memory Capacity Per DIMM		Speed (GHz) and Voltage (V) Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)								
				2 Slots Per Channel				3 Slots Per Channel				
		2GB	4GB	1DPC		2DPC		1DPC		2DPC		3DPC
				1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.5V
RDIMM	SRx4	4GB	8GB	1333	1333	1333	1333	1333	1333	1066, 1333	1333	1066
RDIMM	DRx4	8GB	16GB	1333	1333	1333	1333	1333	1333	1066, 1333	1333	1066
RDIMM	QRx4	16GB	32GB	1066	1066, 1333	1066	1066	1066	1066, 1333	N/A	N/A	N/A
LRDIMM	QRx4	16GB	32GB	1333	1333	1333	1333	1333	1333	1333	1333	1333
LRDIMM (RM)	8Rx4	32GB	64GB	N/A	1066	N/A	1066	N/A	1066	N/A	1066	1066

Notes: 1. For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at http://www.supermicro.com/support/resources/mem.cfm. 2. 1.35V DIMMs are not supported by the 3PDC configuration.

Intel E7 Series Processor RDIMM and LRDIMM Memory Configuration for Lockstep Mode (1:1)

Type	Ranks Per DIMM & Data Width	Maximum DIMM Capacity		Speed (GHz) and Voltage (V) Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)								
				2 Slots Per Channel				3 Slots Per Channel				
		2GB	4GB	1DPC		2DPC		1 DPC		2DPC		3DPC
				1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.5V
RDIMM	SRx8	4GB	8GB	1333	1600	1333	1600	1333	1333, 1600	1066, 1333	1333	1066
RDIMM	DRx8	8GB	16GB	1333	1600	1333	1600	1333	1333, 1600	1066, 1333	1333	1066
RDIMM	SRx4	16GB	32GB	1066	1066, 1333	1066	1066	1066	1066, 1333	N/A	N/A	N/A
LRDIMM	DRx4	16GB	32GB	1333, 1600	1600	1333, 1600	1600	1333	1600	1333	1600	1333
LRDIMM (RM)	QRx4	32GB	64GB	N/A	1066	N/A	1066	N/A	1066	N/A	1066	1066

Notes: 1. For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at http://www.supermicro.com/support/resources/mem.cfm. 2. 1.35V DIMMs are not supported by the 3PDC configuration

Note 1: For the memory modules to work properly, please install DIMM modules of the same type, same speed and same operating frequency in the motherboard. Mixing of DIMMs of different types or different speeds is not allowed.

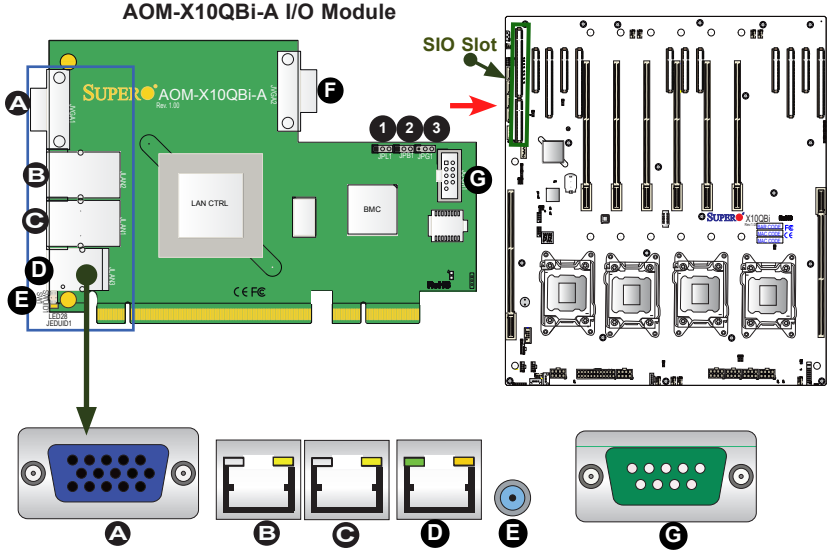
Note 2: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List on our website at http://supermicro.com/support/resources/mem.cfm.

2-7 I/O Module Connectors/Ports

The I/O ports are color coded in conformance with the PC Industry Standards. See the picture below for the colors and locations of the various I/O ports.

Note: Before you power on the system, be sure to install the AOM-X10QBi-A I/O module card into the SIO slot as shown in the figure. Without the I/O module being installed on the baseboard, your system cannot be turned on.

AOM-X10QBi-A I/O Module



I/O Port Locations and Definitions (See the Connector Section)

A. JVG1: VGA/Video Connector 1
B. JLAN2: LAN Port2
C. JLAN1: LAN Port1
D. JLAN3: (BMC) IPMI_LAN
E. UID (Unit Identifier) Switch & UID LED (Blue: Unit Identified)
F. JVG2: VGA/Video Connector 2
G. JCOM1: COM Connection 1

Jumpers (See the Jumper Section)

1. JPL1: LAN Enable/Disable (Default: Pins 1-2: Enabled)
2. JPB1: BMC Enable/Disable (Default: Pins 1-2: Enabled)
3. JPG1: VGA Enable/Disable (Default: Pins 1-2: Enabled)

Serial Ports (COM1: On the I/O Module, COM2: On the Baseboard)

A COM port (COM1) is located on the AOM-X10QBi-A I/O module. Another COM port header (COM2) is located on the X10QBi baseboard to provide front-accessible serial support. See the table on the right for pin definitions.

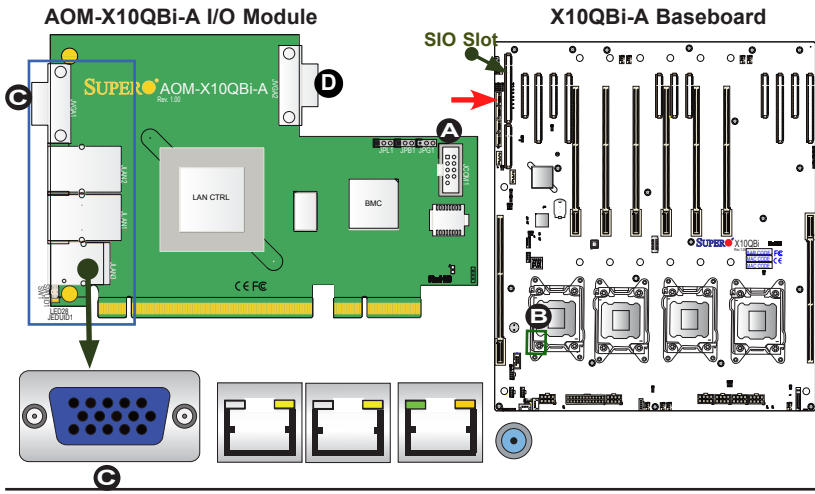
Serial COM) Ports Pin Definitions

Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	N/A

Video Connectors (On the I/O Module)

Two Video (VGA) ports are located on the AOM-X10QBi-A I/O module. Refer to the baseboard layout below for the location.

A. COM1
B. COM2
C. VGA1
D. VGA2



Ethernet Ports (On the I/O Module)

Two Ethernet ports (LAN1/LAN2) are located on the AOM-X10QBi-A I/O module. In addition, an IPMI_dedicated LAN is also located on the I/O module to provide KVM support for IPMI 2.0. All these ports accept RJ45_type cables.

Notes: 1. Please refer to Section 2-11 for LAN LED information.

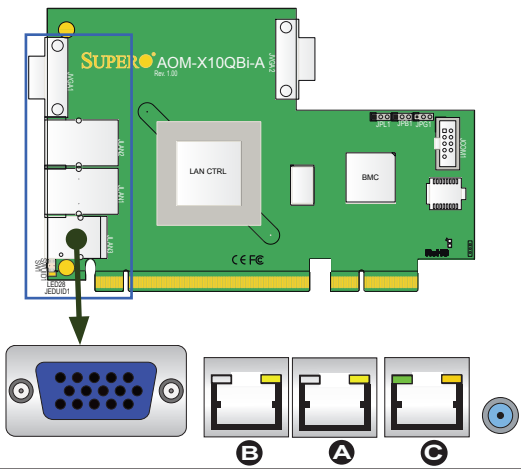
2. USB connections are located on the X10QBi baseboard.

LAN Ports Pin Definition

Pin#	Definition		
1	P2V5SB	10	SGND
2	TD0+	11	Act LED
3	TD0-	12	P3V3SB
4	TD1+	13	Link 100 LED (Yellow, +3V3SB)
5	TD1-	14	Link 1000 LED (Yellow, +3V3SB)
6	TD2+	15	Ground
7	TD2-	16	Ground
8	TD3+	17	Ground
9	TD3-	18	Ground

(NC: No Connection)

AOM-X10QBi-A I/O Module



A. LAN1
B. LAN2
C. IPMI_LAN

Unit Identifier Switch/LEDs (On the I/O Module)

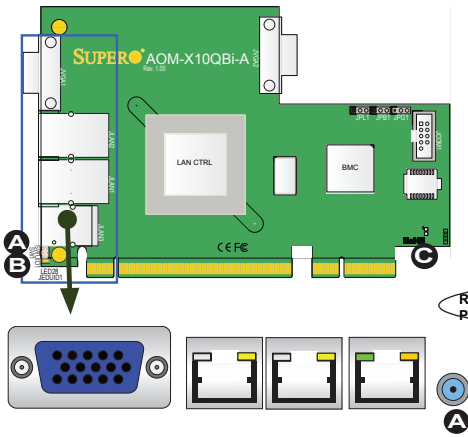
A Unit Identifier (UID) switch on the AOM-X10QBi-A I/O module, and two LED indicators are located on the baseboard. The UID switch is located next to the LAN ports on the I/O module. The rear UID LED (LED28) is located next to the UID switch. The front panel UID LED is located at pins 7/8 of the Front Control Panel at JF1. Connect a cable to pins 7/8 on JF1 for front panel UID LED indication. When you press the UID switch, both rear UID LED and front panel UID LED indicators will be turned on. Press the UID switch again to turn off both LED indicators. These UID indicators provide easy identification of a system unit that may be in need of service.

Note: UID can also be triggered via the IPMI on the system motherboard. For more information on the IPMI, please refer to the IPMI User's Guide posted on our website @http://www.supermicro.com.

UID Switch	
Pin#	Definition
1	Ground
2	Ground
3	Button In
4	Ground

UID LED (LED28) Status		
Color/State	OS Status	
Blue: On	Windows OS	Unit Identified
Blue: Blinking	Linux OS	Unit Identified

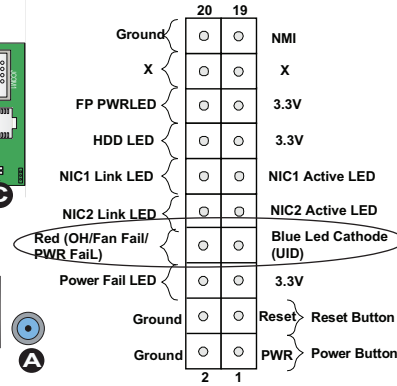
AOM-X10QBi-A I/O Module



A. UID Switch

B. Rear UID LED (LED28)

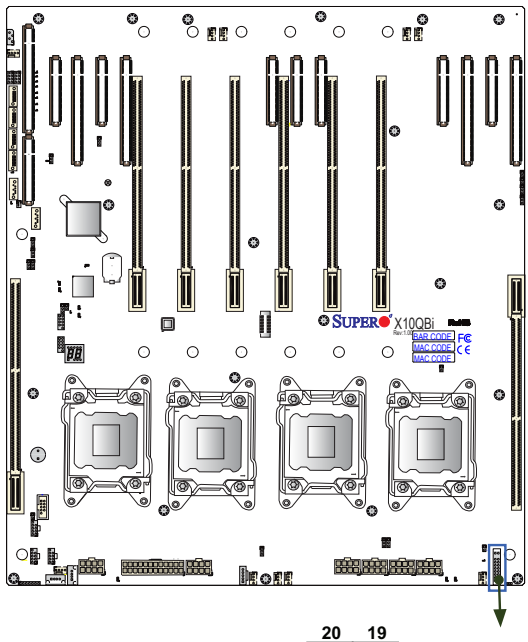
C. Front UID LED

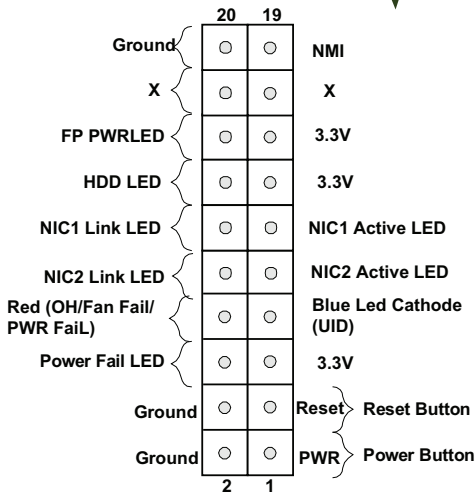


Front Control Panel

JF1 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro's server chassis. See the figure below for descriptions of the various control-panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.

JF1 Header Pins





Front Control Panel Pin Definitions

NMI Button

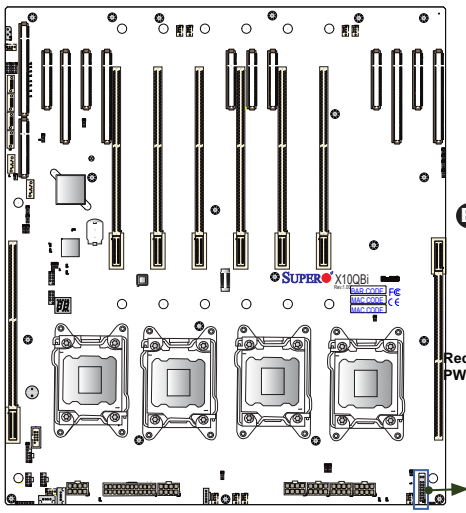
The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)	
Pin#	Definition
19	Control
20	Ground

Power LED

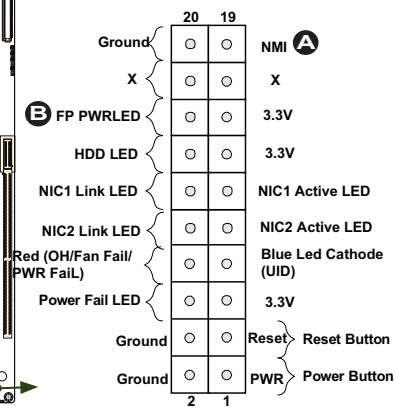
The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	3.3V
16	PWR LED



A. NMI

B. PWR LED



HDD LED

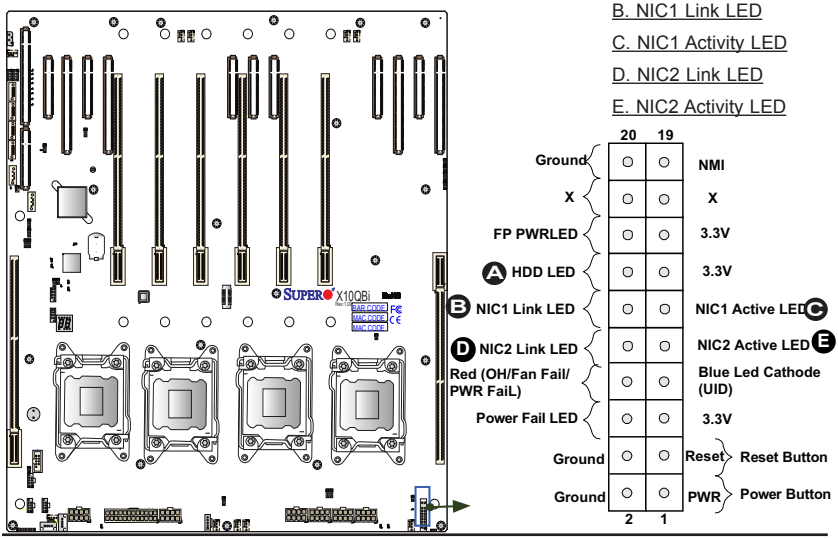
The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable here to indicate HDD activity. Refer to the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	3.3V Standby
14	HD Active

NIC1/NIC2 LED Indicators

The NIC (Network Interface Controller) LED connection for GLAN port 1 is located on pins 11 and 12 of JF1, and the LED connection for GLAN Port 2 is on pins 9 and 10. Attach the NIC LED cables to display network activity. Refer to the table on the right for pin definitions.

GLAN1/2 LED Pin Definitions (JF1)	
Pin#	Definition
9	NIC 2 Activity LED
10	NIC 2 Link LED
11	NIC 1 Activity LED
12	NIC 1 Link LED



Overheat (OH)/Fan Fail/PWR Fail/ UID LED

Connect an LED cable to the OH/ Fan Fail/FP UID connection on pins 7 and 8 of JF1 to provide advanced warnings of chassis overheating or fan failure. It also works as the front panel UID LED indicator. The red LED takes precedence over the blue LED by default. Refer to the table on the right for pin definitions.

OH/Fan Fail/PWR Fail/UID LED Pin Definitions (JF1)

Pin#	Definition
7	Red+ (Blue LED Cathode)
8	Blue+ (OH/Fan Fail/PWR Fail/ UID LED)

OH/Fan Fail Indicator Status

State	Definition
Off	Normal
On	Overheat
Flash-ing	Fan Fail

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

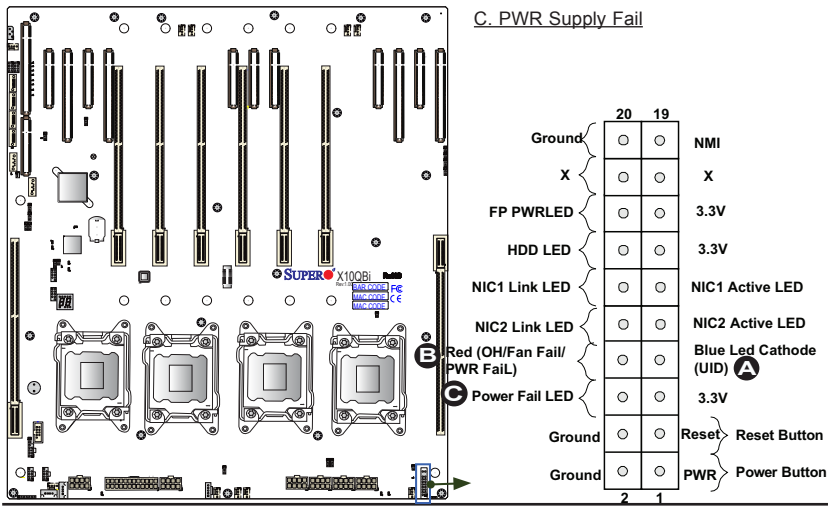
PWR Fail LED Pin Definitions (JF1)

Pin#	Definition
5	3.3V
6	PWR Supply Fail

A. Front UID LED (Blue)

B. OH/ Fail/PWR Fail LED (Red)

C. PWR Supply Fail



Reset Button

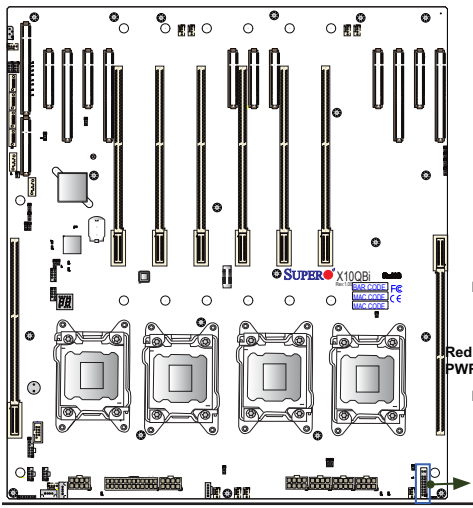
The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to a hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

Power Button

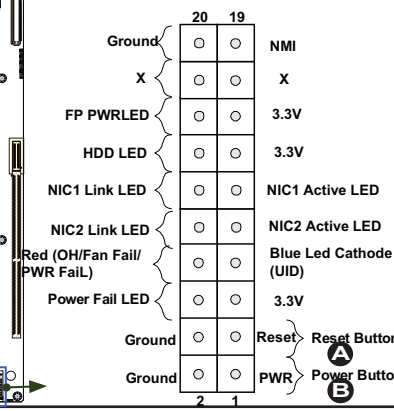
The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in BIOS - see Chapter 5). To turn off the power when the system is set to suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	Signal
2	Ground



A. Reset Button

B. PWR Button



2-8 Connecting Cables

Power Connectors

A 24-pin main power supply connector(JPW 1) and six 8-pin power connectors (JPW2-JPW7) are located on the X10DBi motherboard. These power connectors meet the SSI EPS 12V specification. Be sure to connect these power connectors to your power supply to provide adequate power to your system. Refer to the table on the right for pin definitions.

Warning: To provide adequate power supply to the system, be sure to connect the 24-pin ATX PWR (JPW1) and *six* 8-pin PWR connectors (JPW2-JPW7) to the power supply. Failure to do so will void the manufacturer warranty on your power supply and motherboard.

ATX Power 24-pin Connector Pin Definitions

Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

12V 8-pin PWR Connector Pin Definitions

Pins	Definition
1 through 4	Ground
5 through 8	+12V

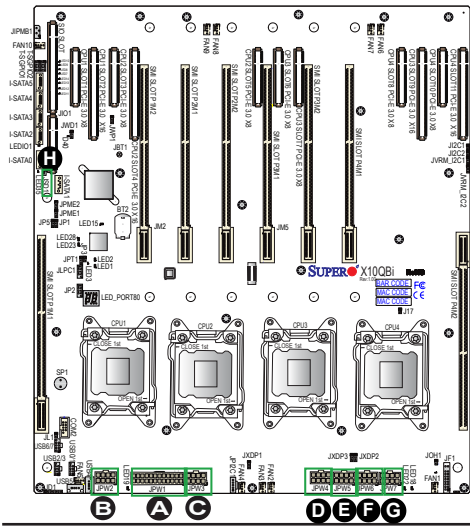
(Required)

DOM Power Connector

A power connector for SATA DOM (Disk-On-Module) devices is located at JSD1. Connect the appropriate cable here to provide power support for your SATA DOM devices.

DOM PWR Pin Definitions

Pin#	Definition
1	+5V
2	Ground
3	Ground



A. JPW1: 24-pin ATX PWR (Req'd)
B. JPW2: 8-pin PWR (Req'd)
C. JPW3: 8-pin PWR (Req'd)
D. JPW4: 8-pin PWR (Req'd)
E. JPW5: 8-pin PWR (Req'd)
F. JPW6: 8-pin PWR (Req'd)
G. JPW7: 8-pin PWR (Req'd)
H. JSD1: SATA Device PWR (Req'd for SATA devices)

Fan Headers

The X10QBi system board has ten system fan headers and ten CPU_card fan headers. All these are 4-pin fans and are backward_compatible with the traditional 3-pin fan. Fan speed control is available via IPMI interface for 4-pin fans only. See the tables on the right for more information.

Fan Header Pin Definitions

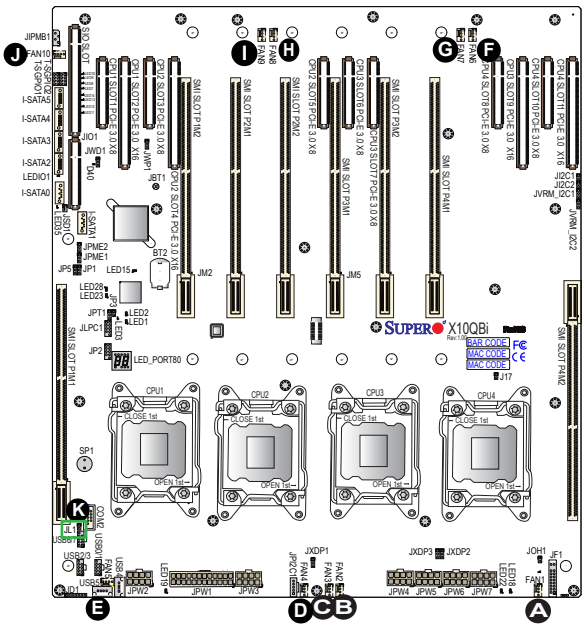
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWR Modulation (4-pin fans only)

Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the system board. Attach an appropriate cable from the chassis to be informed of possible chassis intrusion when the chassis is opened.

Chassis Intrusion Pin Definitions

Pin#	Definition
1	Intrusion Input
2	Ground

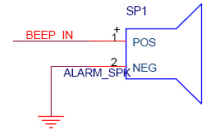


A. Fan1
B. Fan2
C. Fan3
D. Fan4
E. Fan5
F. Fan6
G. Fan7
H. Fan8
I. Fan9
J. Fan 10
K Chassis Intrusion

Internal Buzzer

The internal speaker, located at SP1, can be used to provide audible indications for various beep codes. See the table on the right for pin definitions. Refer to the layout below for the location of the internal buzzer.

Internal Buzzer Pin Definition		
Pin#		Definitions
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker

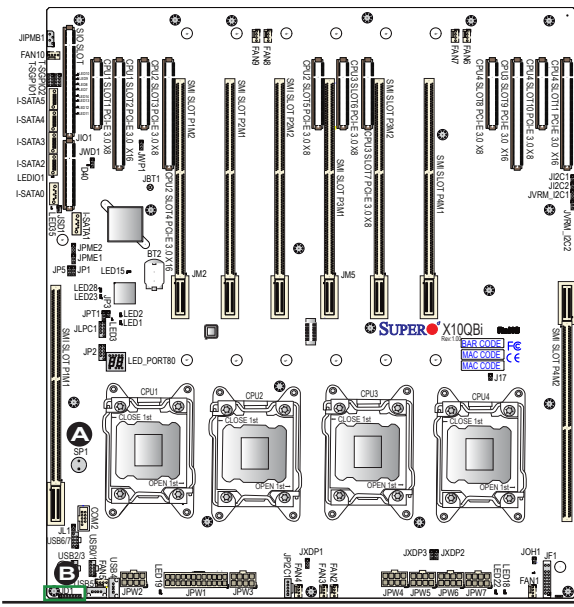


Power LED/Speaker

On the JD1 header, pins 1-3 are used for power LED indication, and pins 4-7 are for the speaker. See the tables on the right for pin definitions. Please note that the speaker connector pins (4-7) are for use with an external speaker. If you wish to use the onboard speaker, close pins 6-7 with a cap.

PWR LED Connector Pin Definitions	
Pin Setting	Definition
Pin 1	Anode (+)
Pin2	Cathode (-)
Pin3	NA

Speaker Connector Pin Settings	
Pin Setting	Definition
Pins 4-7	External Speaker
Pins 6-7	Internal Speaker



A. Internal Buzzer

B. PWR LED/Speaker

Overheat LED/Fan Fail

The JOH1 header is used to connect an LED indicator to provide warnings of chassis overheating or fan failure. This LED will blink when a fan failure occurs. Refer to the table on right for pin definitions.

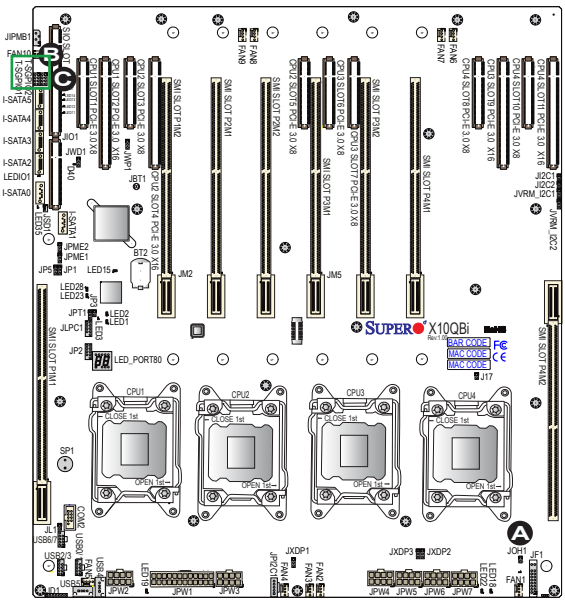
Overheat LED Pin Definitions	
Pin#	Definition
1	5vDC
2	OH Active

OH/Fan Fail LED Status	
State	Message
Solid	Overheat
Blinking	Fan Fail

T-SGPIO 1/2 Headers

Two SGPIO (Serial-Link General -Purpose Input/Output) headers are located on the baseboard. These headers support serial_link interface for onboard SATA connections. Refer to the table on the right for pin definitions.

T-SGPIO Pin Definitions			
Pin#	Definition	Pin	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	Clock	8	NC



A. Overheat LED
B. T-SGPIO1
C. T-SGPIO2

Power SMB (I²C) Connector

The Power System Management Bus (I²C) connector (JPI²C1) is used to monitor onboard power supply, fan and system temperatures. Refer to the table on the right for pin definitions.

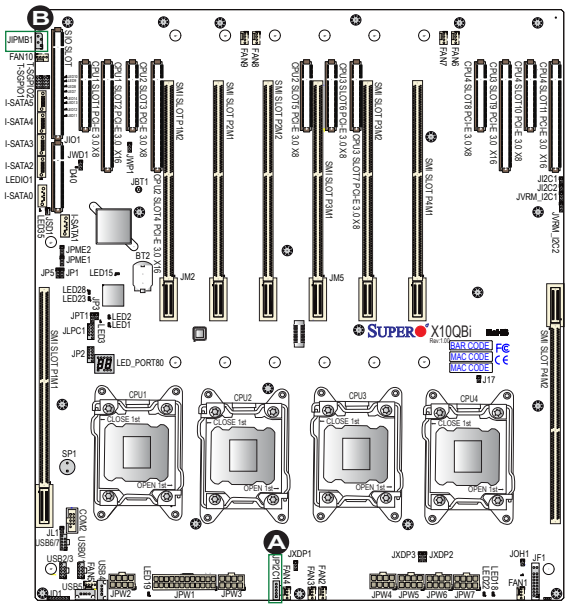
PWR SMB Pin Definitions	
Pin#	Definition
1	Clock
2	Data
3	PMBUS_Alert
4	Ground
5	+3.3V

IPMB

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect the appropriate cable here to use the IPMB I²C connection for your system.

IPMB Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

Note: NC= No Connection



A. JPI²C1

B. JIPMI

Universal Serial Bus (USB) (On the Main Board)

Three Universal Serial Bus headers provide six USB connections (USB 0/1, 2/3, 6/7) on the baseboard. Additionally, two Type A USB connectors (USB4, USB5) are also located on the board. (Cables are not included.) Refer to the tables on the right for pin definitions.

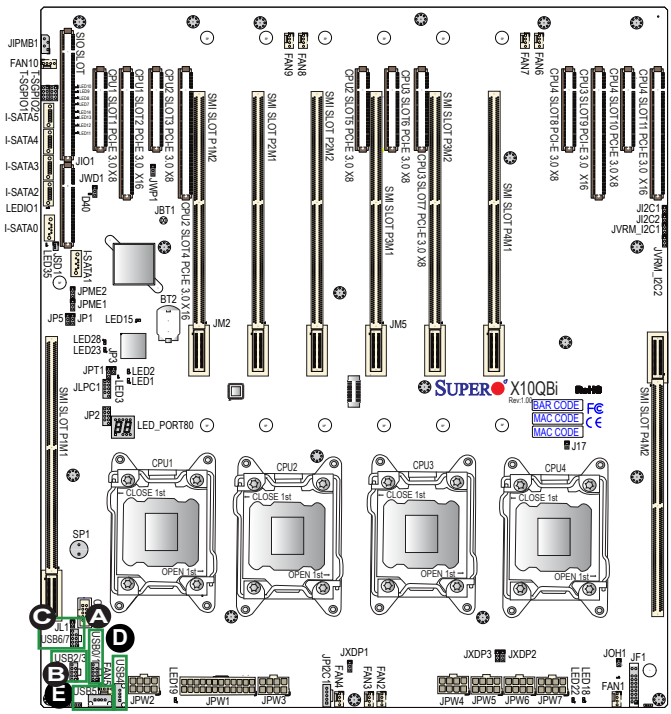
Type A USB (USB4, USB5) Pin Definitions

Pin#	Definition
1	+5V
2	PO-
3	PO+
4	Ground
5	NA

USB (0/1, 2/3, 6/7) Pin Definitions

USB 0/2/6 Pin #	Definition	USB 1/3/7 Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	NC	5	Key

(NC= No connection)



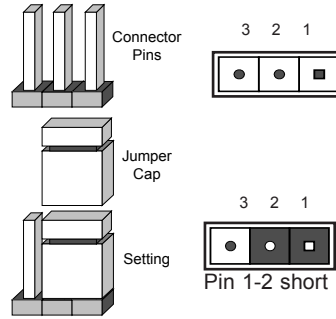
A. USB0/1
B. USB2/3
C. USB6/7
D. USB4
E. USB5

2-9 Jumper Settings

Explanation of Jumpers

To modify the operation of the system board, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the system board layout pages for jumper locations.

Note: On two-pin jumpers, "Closed" means the jumper is on, and "Open" means the jumper is off the pins.

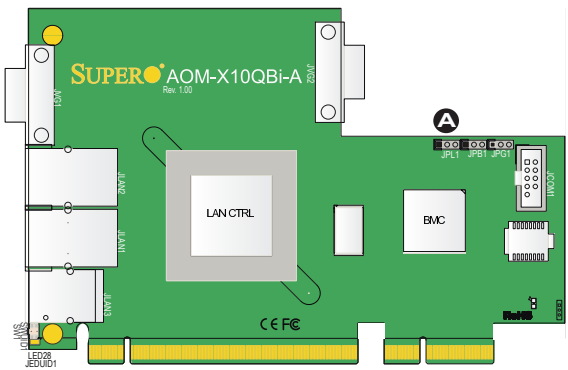


LAN Enable/Disable (On the I/O Module)

JPL1 enables or disables the LAN Port1/LAN Port2 on the X10QBi-A I/O module. Refer to the table on the right for jumper settings. The default setting is Enabled.

LAN Enable Jumper Settings	
Jumper Setting	Definition
1-2	Enabled (default)
2-3	Disabled

A. LAN Enable



BMC Enable (On the I/O Module)

Jumper JPB1 allows you to enable the BMC controller on the X10QBi-A I/O module for IPMI/KVM support. Refer to the table on the right for jumper settings.

BMC Enable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	BMC Enable
Pins 2-3	Normal (Default)

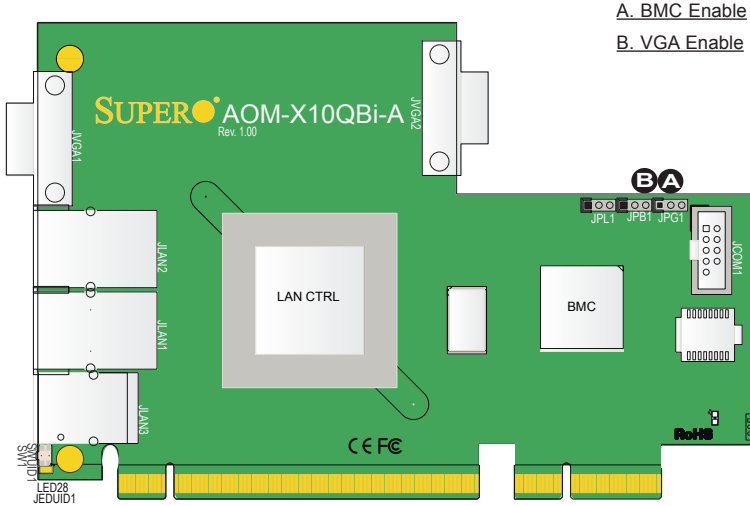
VGA Enable (On the I/O Module)

Jumper JPG1 allows the user to enable VGA Ports 1/2 support on the I/O module. The default setting is "1-2" to enable the connection. Refer to the table on the right for jumper settings.

VGA Enable Jumper Settings	
Jumper Setting	Definition
1-2	Enabled (Default)
2-3	Disabled

A. BMC Enable

B. VGA Enable



CMOS Clear

JBT1 is used to clear the CMOS. Instead of pins, this "jumper" consists of contact pads to prevent the accidental clearing of the CMOS. To clear the CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing the CMOS.

Note 1. For an ATX power supply, you must completely shut down the system, remove the AC power cord, and then short JBT1 to clear the CMOS.

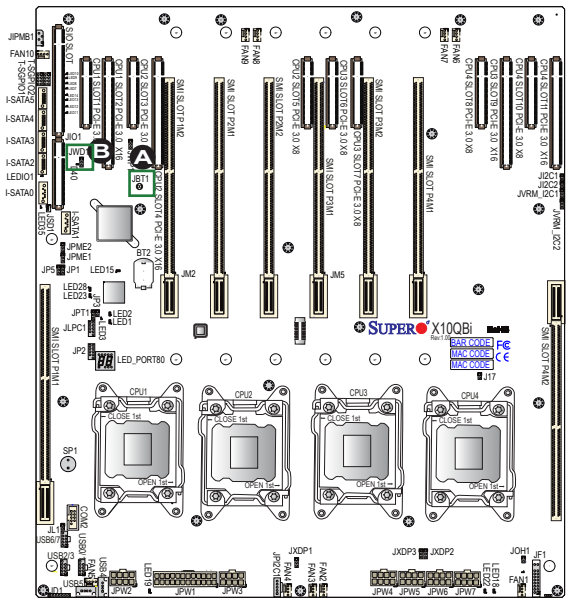
Note 2. Be sure to remove the onboard CMOS Battery before you short JBT1 to clear the CMOS.

Note 3. Clearing the CMOS will also clear any passwords.

Watch Dog Enable/Disable

Watch Dog (JWD1) is a system monitor that can reset the system when a software application hangs. Close pins 1-2 to reset the system if an application hangs. Close pins 2-3 to generate a non-maskable interrupt signal for the application that hangs. Refer to the table on the right for jumper settings. Watch Dog must also be enabled in the BIOS.

Watch Dog Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Reset (default)
Pins 2-3	NMI
Open	Disabled



A. Clear CMOS

B. Watch Dog Enable

I²C Bus to PCI-Exp. Slots

Use Jumpers JI²C1 and JI²C2 to connect the System Management Bus (I²C) to the PCI-E slots to improve system performance. These two jumpers are to be set at the same time. The default setting is Open for normal operation. Refer to the table on the right for jumper settings.

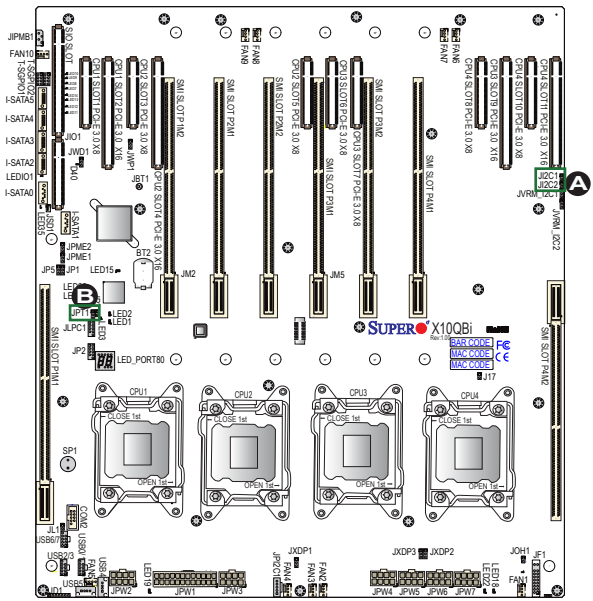
I²C for PCI-E slots Jumper Settings	
Jumper Setting	Definition
Closed	Enabled
Open	Normal (Default)

TPM Support Enable

JPT1 allows the user to enable TPM (Trusted Platform Modules) support which will enhance data integrity and system security. Refer to the table on the right for jumper settings. The default setting is enabled.

TPM Support Enable Jumper Settings	
Jumper Setting	Definition
1-2	Enabled
2-3	Disabled

Note: For more information on IPMI configuration, please refer to the WPCM 450 IPMI BMC User's Guide posted on our website @ http://www.supermicro.com.



A. SMB to PCI-E Slots

B. TPM Enabled

Management Engine (ME) Recovery

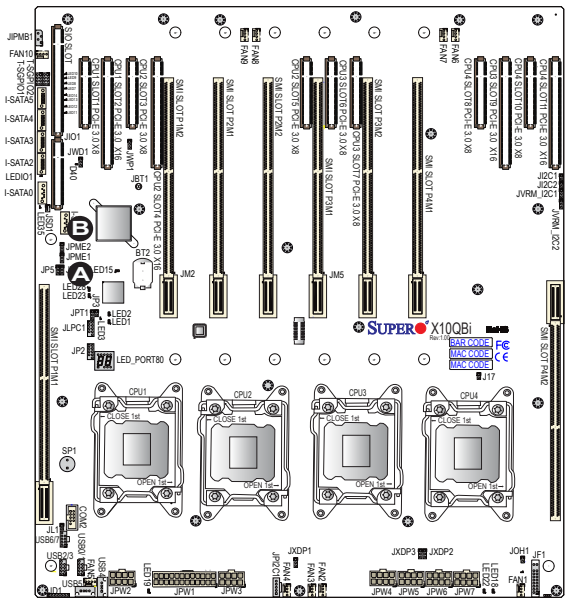
Use Jumper JPME1 to select ME Firmware Recovery mode, which will limit resource allocation for essential system operation only in order to maintain normal power operation and management. In the single operation mode, an online upgrade will be available via Recovery mode. Refer to the table on the right for jumper settings.

ME Recovery Jumper Settings	
Jumper Setting	Definition
1-2	Normal (Default)
2-3	ME Recovery

Manufacturer Mode Select

Close pin 2 and pin 3 of Jumper JPME2 to bypass SPI flash security and force the system to operate in the Manufacturer mode, allowing the user to flash the system firmware from a host server for system-setting modifications. Refer to the table on the right for jumper settings.

ME Mode Select Jumper Settings	
Jumper Setting	Definition
1-2	Normal (Default)
2-3	Manufacturer Mode



A. ME Recovery

B. ME Mode Select

2-10 Onboard LED Indicators

LAN LEDs (On the I/O Module)

Two LAN ports (LAN 1/LAN 2) are located on the I/O module of the system. Each Ethernet LAN port has two LEDs. The yellow LED indicates activity, while the other Link LED may be green, amber, or off to indicate the speed of the connections. Refer to the tables on the right for more information.

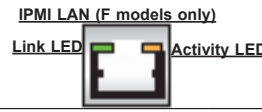
Rear View (when facing the rear side of the chassis)

LAN 1/LAN 2 Link LED (Right) LED State	
LED Color	Definition
Off	No Connection or 10 Mbps
Green	100 Mbps
Amber	1 Gbps

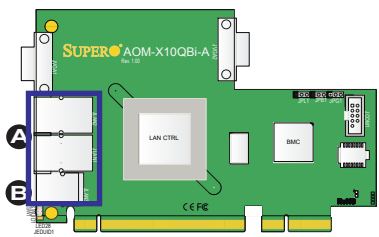
LAN 1/LAN 2 Activity LED (Left) LED State		
Color	Status	Definition
Yellow	Flashing	Active

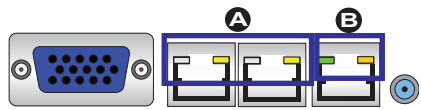
IPMI-Dedicated LAN LEDs (On the I/O Module)

In addition to LAN 1/LAN 2, an IPMI-dedicated LAN is also located on the I/O module. The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. Refer to the tables on th right for more information.



IPMI LAN Link LED (Left) & Activity LED (Right)		
	Color/State	Definition
Link (Left)	Green: Solid	100 Mbps
Activity (Right)	Amber: Blinking	Active





A. LAN1/2 LEDs

B. IPMI LAN LEDs

2-11 Serial ATA Connections

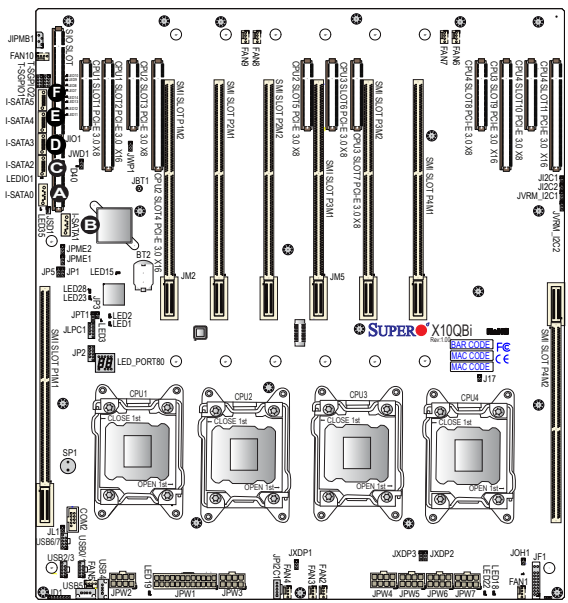
Serial ATA Ports

Six Serial ATA Ports (I-SATA0-I-SATA5) are located on the X10QBi baseboard. I-SATA0/1 support SATA 3.0; I-SATA2-5 support SATA 2.0. These ports, supported by the Intel PCH, provide serial-link signal connections, which are faster than the connections of Parallel ATA. Refer to the table on the right for pin definitions.

Serial_ATA Pin Definitions

Pin#	Definition
1	Ground
2	TX_P
3	TX_N
4	Ground
5	RX_N
6	RX_P
7	Ground

Note: For more information on SATA HostRAID configuration, please refer to the Intel SATA HostRAID User's Guide posted on our Website @ http://www.supermicro.com.



A. I-SATA0
B. I-SATA1
C. I-SATA2
D. I-SATA3
E. I-SATA4
F. I-SATA5

Notes

Chapter 3

Troubleshooting

3-1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the "Technical Support Procedures" and/or "Returning Merchandise for Service" section(s) in this chapter.

> **Note**: Always disconnect the power cord before adding, changing, or installing any hardware components.

Before Power On

1. Make sure that there are no short circuits between the system board, I/O module, memory card, and chassis.
2. Disconnect all ribbon/wire cables from the system board, I/O module, and memory cards, including those for internet and USB connections.
3. Remove all I/O module, and add-on cards.
4. Install the AOM-X10QBi-A I/O module first (-making sure it is fully seated) and connect the front panel connectors to the system board.

No Power

1. Make sure that no short circuits between the system board, I/O module, memory cards and chassis.
2. Make sure that the ATX power connectors are properly connected.
3. Check that the 115V/230V switch on the power supply, if available, is properly set.
4. Turn the power switch on and off to test the system, if applicable.
5. The battery on your system board may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

No Video

1. If the power is on, but you have no video, remove the I/O module, all the add-on cards and cables.

2. Use the speaker to determine if any beep codes exist. Refer to Appendix A for details on beep codes.

System Boot Failure

If the system does not display POST or does not respond after the power is turned on, check the following:

1. Check for any error beep from the speaker on the system board.

- If there is no error beep, try to turn on the system without DIMM modules. If there is still no error beep, try to turn on the system again with only one processor in CPU Socket#1. If there is still no error beep, replace the system board.

- If there are error beeps, clear the CMOS settings by unplugging the power cord and contracting both pads on the CMOS Clear Jumper (JBT1). (Refer to the jumper section in Chapter 2.)

2. Remove all components from the system board, I/O module, and memory cards, especially the DIMM modules. Make sure that the system power is on and that memory error beeps are activated.

3. Turn on the system with only one DIMM module. If the system boots, check for bad DIMM modules or slots by following the Memory Errors Troubleshooting procedure in this chapter.

Losing the System's Setup Configuration

1. Make sure that you are using a high-quality power supply. A poor-quality power supply may cause the system to lose CMOS setup information.

2. The battery on your system motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

3. If the above steps do not fix the setup configuration problem, contact your vendor for repairs.

Memory Errors

When a No_Memory_Beep_Code is issued by the system, check the following:

1. Make sure that the memory modules are compatible with the system and that the DIMM modules are properly and fully installed. (For memory compatibility, refer to the Memory Compatibility chart posted on our website at http://www.supermicro.com.)

2. Check if different speeds of DIMMs have been installed. It is strongly recommended that the same RAM speed of DIMMs are used in the system.

3. Make sure that you are using the correct type of DDR3 Registered or Load Reduced (RDIMM/LRDIMM) ECC of up to 1600 MHz memory (as recommended by the manufacturer).

4. Check for bad DIMM modules or slots by swapping a single module among all memory slots and check the results.

5. Make sure that all memory modules are fully seated in their slots. Follow the instructions given in the Memory section in Chapter 2.

6. Please follow the instructions given in the DIMM population tables listed in the Memory section in Chapter 2 to install your memory modules.

When the System Becomes Unstable

A. When the system becomes unstable during or after OS installation, check the following:

1. CPU/BIOS support: Check whether your CPU is supported and whether you have the latest BIOS installed.

2. Memory support: Make sure that the memory modules are supported by testing the modules using memtest86 or a similar utility.

   Note: Refer to the product page on our Website at http:\\www.supermicro.com for the memory compatibility list.

3. HDD support: Check whether all hard disk drives (HDDs) work properly. Replace the bad HDDs with good ones.

4. System cooling: Check system cooling to make sure that all heatsink fans, and CPU/system fans, etc., work properly. Check Hardware Monitoring settings in the BIOS to make sure that the CPU and system temperatures are within the

normal range. Also, check the front-panel Overheat LED to make sure that the Overheat LED is not on.

5. Adequate power supply: Make sure that the power supply provides adequate power to the system and that all power connectors are connected. Please refer to our website for more information on the minimum power requirement.

6. Proper software support: Make sure that the correct drivers are used.

B. When the system becomes unstable before or during OS installation, check the following:

1. Source of installation: Make sure that the devices used for installation are working properly, including boot devices such as CD/DVD discs, CD/DVD-ROMs.

2. Cable connection: Check to make sure that all cables are connected and working properly.

3. Using minimum configuration for troubleshooting: Remove all unnecessary components (starting with add-on cards first), and use the minimum configuration (with a CPU and a memory module installed) to identify the trouble areas. Refer to the steps listed in Section A above for proper troubleshooting procedures.

4. Identifying bad components by isolating them: If necessary, remove the component in question from the chassis, and test it in isolation to make sure that it works properly. Replace a bad component with a good one.

5. Check and change one component at a time instead of changing several items at the same time. This will help isolate and identify the problem.

6. To find out if a component is good, swap it with a new one to see if the system works properly. If so, then the old component is bad. You can also install the component in question in another system. If the new system works, the component is good and the old system has problems.

3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, please note that as a system and motherboard manufacturer, Supermicro also sells products through its channels, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problems with the specific system configuration that was sold to you.

1. Please go through the "Troubleshooting Procedures" and "Frequently Asked Question" (FAQ) sections in this chapter or see the FAQs on our website (http://www.supermicro.com/) before contacting Technical Support.

2. BIOS upgrades can be downloaded from our website (http://www.supermicro.com).

3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:

- System board model and PCB revision number
- BIOS release date/version (This can be seen on the initial display when your system first boots up.)
- System configuration

4. An example of a Technical Support form is on our website at (http://www.supermicro.com).

- Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com.

3-3 Battery Removal and Installation

Battery Removal

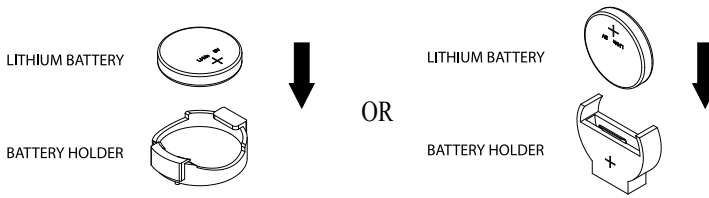
To remove the onboard battery, follow the steps below:

1. Power off your system and unplug your power cable.

2. Locate the onboard battery as shown below.

3. Using a tool such as a pen or a small screwdriver, push the battery lock outwards to unlock it. Once unlocked, the battery will pop out from the holder.

4. Remove the battery.



Proper Battery Disposal

Warning! Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

3-4 Frequently Asked Questions

Question: What are the various types of memory that my system motherboard can support?

Answer: The X10QBi supports Registered (RDIMM)/Load Reduced (LRDIMM) ECC DDR3 of up to 1600 MHz memory. It is strongly recommended that you do not mix memory modules of different types, speeds and sizes. Please follow all memory installation instructions given in the memory section in Chapter 2.

Question: How do I update my BIOS?

It is recommended that you **do not** upgrade your BIOS if you are not experiencing any problems with your system. Updated BIOS files are located on our website at http://www.supermicro.com. Please check our BIOS warning message and the information on how to update your BIOS on our website. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. You can choose from the zip file or the .exe file. If you choose the zip BIOS file, please unzip the BIOS file onto a bootable USB device. Run the batch file using the format AMI.bat filename.rom from your bootable USB device to flash the BIOS. Then, your system will automatically reboot.

Warning: Do not shut down or reset the system while updating BIOS to prevent possible system boot failure.)

Note: The SPI BIOS chip used in this system board cannot be removed. Send your system board back to our RMA Department at Supermicro for repair. For BIOS Recovery instructions, please refer to the AMI BIOS Recovery Instructions posted at http://www.supermicro.com.

Question: What's on the CD that came with my system motherboard?

Answer: The supplied compact disc has drivers and programs that will greatly enhance your system performance. We recommend that you review the CD and install the applications you need. Applications on the CD include chipset drivers for the Windows OS, security, and audio drivers.

Question: How do I handle the used battery?

Answer: Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

3-5 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and the package should be mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete. For faster service, you can also request an RMA authorization online (http://www.supermicro.com).

This warranty only covers normal consumer use and does not cover any damage incurred in shipping or from any failure caused by alternation, misuse, abuse, or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Notes

Chapter 4

BIOS

4-1 Introduction

This chapter describes the AMI BIOS setup utility for the X10QBi Platform. It also provides the instructions on how to navigate the AMI BIOS setup utility screens. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated.

Starting BIOS Setup Utility

To enter the AMI BIOS setup utility screens, press the <Del> key while the system is booting up.

Note: In most cases, the <Del> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F3>, <F4>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for informational text. When an option is selected in the left frame, it is highlighted in white. Often informational text will accompany it.

Note: The AMI BIOS has default informational messages built in. The manufacturer retains the option to include, omit, or change any of these informational messages.

The AMI BIOS setup utility uses a key-based navigation system called "hot keys." Most of the AMI BIOS setup utility "hot keys" can be used at any time during setup navigation. These keys include <F3>, <F4>, <Enter>, <ESC>, arrow keys, etc.

Note 1: Options printed in **Bold** are default settings.

Note 2: <F3> is used to load optimal default settings. <F4> is used to save the settings and exit the setup utility.

How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS setup utility. This setup utility can be accessed by pressing <Delete> at the appropriate time during system boot.

Note: For AMI UEFI BIOS Recovery, please refer to the UEFI BIOS Recovery User Guide posted @ http://www.supermicro.com/support/manuals/.

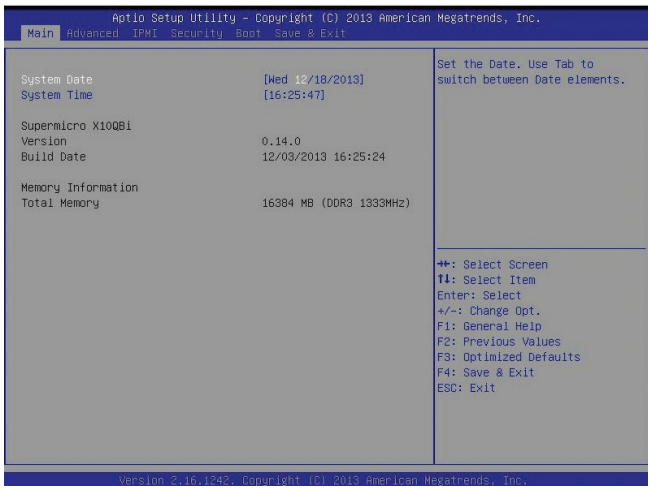
Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS setup utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

Warning: Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall the manufacturer be liable for direct, indirect, special, incidental, or consequential damage arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is being updated to avoid possible boot failure.

4-2 Main Setup

When you first enter the AMI BIOS setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.



The AMI BIOS Main menu displays the following information:

System Date/System Time

Use this option to change the system date and time using the arrow keys. Enter new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in Day MM/DD/YYYY format. The time is entered in HH:MM:SS format. (**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.).

Supermicro X10QBi

Version

This item displays the SMC version of the BIOS ROM used in this system.

Build Date

This item displays the date that the BIOS setup utility was built.

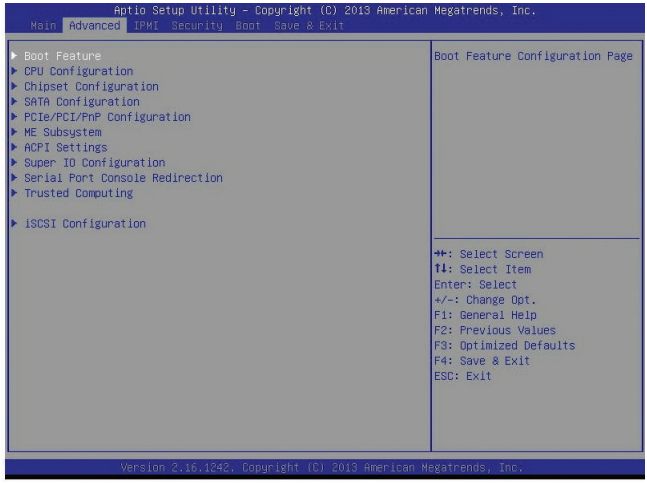
Memory Information

Total Memory

This item displays the amount of memory that is available in the system.

4-3 Advanced Setup Configurations

Select the Advanced tab to access the following submenu items.



▶Boot Features

Boot Configuration

Quiet Boot

Use this item to select bootup screen display between POST messages and the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

Use this item to set the display mode for the Option ROM. Select Keep Current to use the current AddOn ROM Display setting. Select Force BIOS to use the Option ROM display set by the system BIOS. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock

Use this item to set the power-on state for the Numlock key. The options are Off and **On**.

Wait For 'F1' If Error

Select Enabled to force the system to wait until the 'F1' key is pressed when an error occurs. The options are Disabled and **Enabled**.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Immediate, the BIOS ROM of the host adaptors will immediately capture Interrupt 19 at bootup and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Postponed, the BIOS ROM of the host adaptors will only capture Interrupt 19 during bootup from a legacy device. The options are **Immediate** and Postponed.

Power Configuration

Watch Dog Function

If enabled, the Watch Dog timer will allow the system to automatically reboot when a non-recoverable error that lasts for more than five minutes occurs. The options are Enabled and **Disabled.**

Power Button Function

If this feature is set to Instant Off, the system will power off immediately as soon as the user presses the power button. If this feature is set to 4 Seconds Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant Off** and 4 Seconds Override.

Restore on AC Power Loss

Use this item to set the power state after a power outage. Select Stay Off for the system power to remain off after a power outage. Select Power On to turn on the system power after a power outage. Select Last State to allow the system to resume its last power state before a power outage. The options are Power On, Stay Off, and **Last State**.

▶CPU Configuration

This submenu displays the following CPU information as detected by the BIOS. It also allows the user to configure CPU settings.

▶Processor 0/Processor 1/Processor 2/Processor 3

This submenu displays the following information of the CPU installed in Socket 1, Socket 2, Socket 3, and Socket 4.

- Processor Socket
- Processor ID
- Processor Frequency

- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- L3 Cache RAM
- Processor 0 Version
- Processor 1 Version
- Processor 2 Version
- Processor 3 Version

Clock Spread Spectrum

Select Enable to allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disable** and Enable.

Hyper-Threading

Select Enable to support Intel's Hyper-threading Technology to enhance CPU performance. The options are **Enable** and Disable.

Performance/Watt

Select Power Optimized to enable Intel® Turbo Boost Technology support when the Power Performance State P0 has lasted more than two seconds. The options are **Traditional** and Power Optimized.

Clear MCA (Available if supported by the OS & the CPU)

Select Yes to enable Machine-Check Architecture (MCA) support for CPU error logging. This feature is used in conjunction with the items below: "Execute Disable Bit," "VMS," "Enable SMX," and "Lock Chipset" for Virtualization media support. The default setting is **No.**

Execute-Disable Bit (Available if supported by the OS & the CPU)

Select Enable for Execute Disable Bit Technology support, which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. This feature is used in conjunction with the items: "Clear MCA," "VMX," "Enable SMX,"

and "Lock Chipset" for Virtualization media support. The default setting is **Enable**. (Refer to Intel and Microsoft websites for more information.)

VMX

Select Enable for CPU-related Virtualization support. This feature is used in conjunction with the items: "Clear MCA," "Enable SMX," and "Lock Chipset" for Virtualization media support. The options are **Enable** and Disable.

Enable SMX

Select Enable for Safer Mode Extensions (SMX) support to enhance data security in the processor. This feature is used in conjunction with the items: "Clear MCA," "VMX," and "Lock Chipset" for Virtualization media support. The options are Enable and **Disable**.

Lock Chipset

Select Enable to lock chipset register tables and set the register tables to "read-only" to prevent new data being written into the processor to ensure system security. This feature is used in conjunction with the items: "Clear MCA," "VMX," and "Enable SMX" for Virtualization media support. The options are **Enable** and Disable.

BIST Selection

Select Enable to configure Built-In_Self_Test (BIST) settings, which will allow the system to perform BIST testing on the processors at bootup. The options are Enable and **Disable**.

Hardware Prefetcher (Available when supported by the CPU)

If set to Enable, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are Disable and **Enable**.

Adjacent Cache Line Prefetch (Available when supported by the CPU)

Select Enable for the CPU to prefetch both cache lines for 128 bytes as comprised. Select Disable for the CPU to prefetch both cache lines for 64 bytes. The options are Disable and **Enable**.

Note: Please reboot the system for changes on this setting to take effect. Please refer to Intel's web site for detailed information.

DCU (Data Cache Unit) Streamer Prefetcher (Available when supported by the CPU)

If set to Enable, the DCU Streamer Prefetcher will prefetch data streams from the cache memory to the DCU (Data Cache Unit) to speed up data accessing and processing for CPU performance enhancement. The options are Disable and **Enable**.

DCU IP Prefetcher

If this feature is set to Enable, the IP prefetcher in the DCU (Data Cache Unit) will prefetch IP addresses to improve network connectivity and system performance. The options are **Enable** and Disable.

DCU Mode

Use this feature to set the data-prefecting mode for the DCU (Data Cache Unit). The options are **32KB 8Way Without ECC** and 16KB 4Way With ECC.

Direct Cache Access (DCA)

Select Enable to use Intel DCA (Direct Cache Access) Technology to improve the efficiency of data transferring and accessing. The options are **Enable** and Disable.

DCA Prefetch Delay

A DCA Prefetcher is used with a TOE (TCP/IP Offload Engine) adapter to prefetch data in order to shorten execution cycles and maximize data processing efficiency. Prefetching data too frequently can saturate the cache directory and delay necessary cache access. This feature reduces or increases the frequency the system prefetches data. The options are [8], [16], **[32]**, [40], [48], [56], [64], [72], [80], [88], [96], [104], [112], [120].

Extended APIC (Advanced Programmable Interrupt Controller)

Based on Intel's Hyper-Threading architecture, each logical processor (thread) is assigned 256 APIC IDs (APIDs) in 8-bit bandwidth. When this feature is set to Enable, the APIC ID will be expanded from 8 bits to 16 bits to provide 512 APIDs to each thread to enhance CPU performance. The options are **Disable** and Enable.

AES-NI

Select Enable to use the Intel Advanced Encryption Standard (AES) New Instructions (NI) to ensure data security. The options are **Enable** and Disable.

Down Stream PECI (Platform Environment Control Interface)

Select Enable to allow the client server to interact with the host server directly to achieve better host-client communication in the PECI platform, which will result in power saving and energy use efficiency. The options are **Disable** and Enable.

▶ Advanced Power Management Configuration

Advanced Power Management Configuration

Power Technology

Select Energy Efficient to support power-saving mode. Select Custom to customize system power settings. Select Max Performance to optimize system

performance. Select Disabled to disable power-saving settings. The options are Disabled, **Energy Efficient**, and Custom. If the option is set to Custom, the following items will display:

▶ CPU P State Control (Available when Power Technology is set to Custom)

EIST (P-states)

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency to reduce power consumption and heat dissipation. The options are Disabled and **Enabled**.

Turbo Mode

Select Enabled to use the Turbo Mode to boost system performance. The options are **Enabled** and Disabled.

P-state Coordination

This feature is used to change the P-state (Power-Performance State) coordination type. P-state is also known as "SpeedStep" for Intel processors. Select HW_ALL to change the P-state coordination type for hardware components only. Select SW_ALL to change the P-state coordination type for all software installed in the system. Select SW_ANY to change the P-state coordination type for a software program in the system. The options are **HW_All,** SW_ALL, and SW_ANY.

▶ CPU C State Control (Available when Power Technology is set to Custom)

C2C3TT (C2-to-C3 Transaction Timer)

This feature is used to set the transaction timer from C2 to C3. Enter 0 for Auto, which will allow the BIOS to configure the transaction timer automatically. The Default setting is **0 (Auto)**.

Package C State limit

Use this item to set the limit on the C-State package register. The options are C0/1 state, C2 state, **C6 (non-Retention) state**, and C6 (Retention) state.

CPU C3 Report

Select Enable to allow the BIOS to report the CPU C3 State (ACPI C2) to the operating system. During the CPU C3 State, the CPU clock generator is turned off. The options are Enable and **Disable.**

CPU C6 Report (Available when Power Technology is set to Custom)

Select Enable to allow the BIOS to report the CPU C6 state (ACPI C3) to the operating system. During the CPU C6 state, power to all cache is turned off. The options are **Enable** and Disable.

▶ CPU T State Control

ACPI (Advanced Configuration Power Interface) T-States

Select Enable to support CPU throttling by the operating system to reduce power consumption. The options are **Enable** and Disable.

▶ CPU Advanced PM (Power Management) Tuning

▶ Energy Perf (Performance) BIAS

Energy/Performance Bias

Use this feature to select an appropriate fan setting to achieve maximum system performance (with maximum cooling) or maximum energy efficiency with maximum power saving). The fan speeds are controlled by the firmware management via IPMI 2.0. The options are Performance, **Balanced Performance**, Balanced Power, and Energy Power.

Workload Configuration

Use this feature to set the power management setting optimized for the regular workload condition. The options are **Balanced (recommended)** and I/O sensitive.

▶ Socket RAPL (Running Average Power Limit) Configuration

Turbo Pwr (Power) Limit Lock

Select Enable to set the power use limit for the machine when it is running in the turbo mode. The options are Enable and **Disable**.

Long Pwr (Power) Limit Ovrd (Override)

Select Enable to support long-term power limit override. If this feature is disabled, BIOS will set the default value. The options are Enable and **Disable**.

Short Pwr (Power) Limit En (Enable)

Select Enable to support Short Duration Power Limit (Power Limit 2). The options are Enable and **Disable**.

▶Chipset Configuration

▶North Bridge

This feature is used to configure Intel North Bridge settings.

▶Integrated IO Configuration

IIO Configuration

Note: For IIO1 Configuration/IIO2 Configuration/IIO3 Configuration, please refer to Page 4-16.

PCIe Train by BIOS

Select Yes to resume the operation of a PCI-E device when the device is trapped and put on halt by a "wait-for-BIOS" command. The options are No and **Yes**.

PCIe Hot Plug

Select Enable to designate a PCI-E device for hot plugging, which will allow the user to replace this device without shutting down the system. The options are Disable, **Enable**, Auto, and Manual.

PCIe APCI Hot Plug

Select Enable to enable hot-plugging support for a PCI-E device in the APCI (Advanced Power Configuration Interface) environment, which will allow the user to replace this device in the APCI environment without shutting down the system. The options are **Disable,** Enable, and Per-Port.

MC (Memory Controller) BaseAddress Range

When this feature is set to Auto, system memory that resides within a certain BaseAddress range in the memory controller will be allocated for MultiCast testing. The default setting is **Auto**.

MC (Memory Controller) Index

Use this feature to set the memory-tuning criteria for the memory controller. The options are **12** and 20.

MC (Memory Controller) NUM (Number) Group

Use this feature to enter the group number of a memory controller. The options are 1, **8**, 32, and 64.

EV DFX (Device Function On-Hide) Feature

When this feature is set to Enable, the EV_DFX Lock Bits that are located on a processor will always remain clear during electric tuning. The options are **Disable** and Enable.

IIO0 Configuration

IOU0 (II0 PCIE Port 2)

This item configures the PCI-E port Bifuraction setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IOU1 (II0 PCIE Port 3)

This item configures the PCI-E port Bifuraction setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

PCI-E Completion Timeout

Select Enable for PCI-E Completion Timeout support for electric tuning. The options are **Enable** and Disable.

PCI-E Completion Timeout Value

Use this item to set the PCI-E Completion Time-out value for electric tuning. Enter a value between 260ms to 900ms.

▶PCI Express Port 0 (DMI)

Note: For PCI Express Port 1A/Port 1B/Port 2A/Port 2B/Port 2C/Port 2D/Port 3A/Port 3B/Port 3C/Port 3D, see the next section.

Use the items below to configure the PCI-E settings for a PCI-E port specified by the user.

The following items will display:

- PCI-E Port Link Status
- PCI-E Port Link Max
- PCI-E Port Link Speed

Link Speed

Use this item to select the PCI-E link speed for the PCI-E port specified by the user. The options are GEN1 (2.5 GT/s), GEN2 (5 GT/s), and **Auto**.

Override Max Link Width

Use this feature to set the link speed for a selected PCI-E port to override the maximum link-width which was previously set by PCI-Bifurcation. The options are **Auto**, x1, x2, x4, x8, and x16.

PCI-E Port DeEmphasis

Use this item to select the De-Emphasis control setting for a PCI-E port specified by the user. The options are **-6.0 dB** and -3.5 dB.

PCI-E ASPM Support

Select Enable to support the Active State Power Management (ASPM) level for a PCI-E port specified by the user. Select Disabled to disable ASPM support. The options are **Disable** and L1 Only.

Fatal Err (Error) Over

Select Enable to force the fatal error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

Non-Fatal Err (Error) Over

Select Enable to force non-fatal error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

Corr (Correctable) Err (Error) Over

Select Enable to force correctable error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

L0s Support

When this item is set to Disable, II0 will never put its transmitter in the L0s state. The options are **Disable** and Enable.

▶PCI Express Port 1A/Port 1B/Port 2A/Port 2B/Port 2C/ Port 2D/Port 3A/Port 3B/Port 3C/Port 3D

Use the items below to configure the PCI-E settings for a PCI-E port specified by the user.

The following items will display:

- PCI-E Port Link Status
- PCI-E Port Link Max
- PCI-E Port Link Speed

PCI-E Port

Select Enable to enable the PCI-E port specified by the user. The options are **Auto**, Enable, and Disable.

Hot Plug Capable

Select Enable to enable hot-plugging support for the PCI-E port specified by the user, which will allow the user to replace the device installed on the port without shutting down the system. The options are **Disable** and Enable.

PCI-E Port Link

Select Disable to disable the link that is not involved in PCI training, but its CFG space is still active. The options are **Enable** and Disable.

Link Speed

Use this item to select the PCI-E link speed for the PCI-E port specified by the user. The options are GEN1 (2.5 GT/s), GEN2 (5 GT/s), and **Auto**.

Override Max Link Width

This item allows the user to set the link speed for a selected PCI-E port to override the maximum link-width which was previously set by PCI-Bifurcation. The options are **Auto**, x1, x2, x4, x8, and x16.

PCI-E Port DeEmphasis

Use this item to select the De-Emphasis control setting for a PCI-E port specified by the user. The options are **-6.0 dB** and -3.5 dB.

PCI-E ASPM Support

Select Enable to support the Active State Power Management (ASPM) level for a PCI-E port specified by the user. Select Disabled to disable ASPM support. The options are **Disable** and L1 Only.

Fatal Err (Error) Over

Select Enable to force the fatal error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

Non-Fatal Err (Error) Over

Select Enable to force the non-fatal error propogation to the II0 core error logic for the port specified by the user. The options are **Disable** and Enable.

Corr (Correctable) Err (Error) Over

Select Enable to force the correctable error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

L0s Support

When this item is set to Disable, II0 will never put its transmitter in the L0s state. The options are **Disable** and Enable.

PM ACPI Support

Select Enable to generate an _HPGPE message on a PM ACPI event. Select Disable to generate an MSI message. The options are **Disable** and Enable.

Gen3 (Generation 3) Eq (Equalization) Mode

Use this item to set PCI-E Gen3 Adaptive Equalization mode. The options are **Auto**, Enable Phase 0, 1, 2, 3; Disable Phase 0, 1, 2, 3; Enable Phase 1 Only, Enable Phase 0, 1 Only, and Advanced.

Gen3 (Generation 3) Spec (Specifics) Mode

Use this item to set the Specifics mode for PCI-E Gen3 device. The options are **Auto**, 0.70 July, 0.70 Sept and 071 Sept.

Gen3 (Generation 3) Phase2 Mode

Use this item to configure the Loop-count setting for PCI-E Gen3 Phase 2. The options are **Hardware Adaptive** and Manual.

Gen3 (Generation 3) DN TX Preset

Use this item to set the Preset mode for PCI-E Gen3 downstream transactions (from the master device to a slave device). The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0 /3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Gen3 (Generation 3) DN TX Preset Hint

Use this item to set the Preset Hint mode for PCI-E Gen3 downstream transactions (from the master device to a slave device). The options are **Auto**, P0 (-6.0 dB), P1 (-7.0 dB), P2 (-8.0 dB), P3 (-9.0 dB), P4 (-10.0 dB) P5 (-11.0 dB), and P6 (-12.0 dB).

Gen3 (Generation 3) Up TX Preset

Use this item to set the Preset mode for PCI-E Gen3 upstream transactions (from a slave device to the master device).The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0/3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Hide Port?

Select Yes to hide a selected PCI-E port from the OS. The options are **No** and Yes.

IIO1 Configuration/IIO2 Configuration/IIO3 Configuration

IOU0 (II0 PCIE Port 2)

This item configures the PCI-E port Bifuraction settings for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IOU1 (II0 PCIE Port 3)

This item configures the PCI-E port Bifuraction settings for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

PCI-E Completion Timeout

Select Enable to issue a "time-out" command when PCI-E electric tuning is completed. The options are **Enable** and Disable.

PCI-E Completion Timeout Value

Use this item to set the PCI-E Completion Time-out value. Enter a value between 260ms to 900ms.

No PCI-E Port Active EC0

This is a workaround setting when there is no active PCI-E port detected. The options are **PCU Squelch exit ignore option**, and Reset the SQ FLOP by CSR optio.

▶PCI Express Port 0/Port 1A/Port 1B/Port 2A/Port 2B/Port 2C/Port 2D/Port 3A/Port 3B/Port 3C/Port 3D

Use the items below to configure the PCI-E settings for a PCI-E port specified by the user.

The following items will display:

- PCI-E Port Link Status
- PCI-E Port Link Max
- PCI-E Port Link Speed

PCI-E Port

Select Enable to enable the PCI-E port specified by the user. The options are **Auto**, Enable, and Disable.

Hot Plug Capable

Select Enable to enable hot-plugging support for the PCI-E port specified by the user to allow the user to replace the device installed on the port without shutting down the system. The options are **Disable** and Enable.

PCI-E Port Link

Select Disable to disable the link that is not involved in training activities, but its CFG is still active. The options are **Enable** and Disable.

Link Speed

Use this item to select the link speed for the PCI-E port specified by the user. The options are GEN1 (2.5 GT/s), GEN2 (5 GT/s), and **Auto**.

Override Max Link Width

Use this item to set the link speed for a selected PCI-E port to override the maximum link width that was set by PCI-bifurcation. The options are **Auto**, x1, x2, x4, x8, and x16.

PCI-E Port DeEmphasis

Use this item to select the De-Emphasis control setting for a PCI-E port specified by the user. The options are **-6.0 dB** and -3.5 dB.

PCI-E ASPM Support

Select Enable to support the Active State Power Management (ASPM) level for a PCI-E port specified by the user. Select Disabled to disable ASPM support. The options are **Disable** and L1 Only.

Fatal Err (Error) Over

Select Enable to force the fatal error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

Non-Fatal Err (Error) Over

Select Enable to force the non-fatal error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

Corr (Correctable) Err (Error) Over

Select Enable to force the correctable error propogation to the II0 core-error-logic for the port specified by the user. The options are **Disable** and Enable.

L0s Support

When this item is set to Disable, II0 will never put its transmitter in the L0s state. The options are **Disable** and Enable.

PM ACPI Support

Select Enable to generate an _HPGPE message on a PM ACPI event. Select Disable to generate an MSI message. The options are **Disable** and Enable.

Gen3 (Generation 3) Eq (Equalization) Mode

Use this item to set the "Adaptive Equalization" mode for PCI-E Generation 3 devices. The options are **Auto**, Enable Phase 0, 1, 2, 3; Disable Phase 0, 1, 2, 3; Enable Phase 1 Only, Enable Phase 0, 1 Only, and Advanced.

Gen3 (Generation 3) Spec (Specifics) Mode

Use this item to set the Specifics mode for PCI-E Generation 3 devices. The options are **Auto**, 0.70 July, 0.70 Sept and 071 Sept.

Gen3 (Generation 3) Phase2 Mode

Use this item to set the PCI-E Generation 3 Phase 2 mode. The options are **Hardware Adaptive** and Manual.

Gen3 (Generation 3) DN TX Preset

Use this item to set the Preset mode for PCI-E Gen3 downstream transactions (from the master device to a slave device). The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0 /3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Gen3 (Generation 3) DN TX Preset Hint

Use this item to set the Preset Hint mode for PCI-E Gen3 downstream transactions (from the master device to a slave device). The options are **Auto**, P0 (-6.0 dB), P1 (-7.0 dB), P2 (-8.0 dB), P3 (-9.0 dB), P4 (-10.0 dB) P5 (-11.0 dB), and P6 (-12.0 dB).

Gen3 (Generation 3) Up TX Preset

Use this item to set the Preset mode for PCI-E Gen3 upstream transactions (from a slave device to the master device).The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0/3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Hide Port?

Select Yes to hide the PCI-E port specified from the OS. The options are **No** and Yes.

▶Integrated IO Configuration

Enable I/OAT

Select Enable to enable Intel I/OAT (I/O Acceleration Technology), which significantly reduces CPU overhead by leveraging CPU architectural improvements and freeing the system resource for other tasks. The options are Enable and **Disable**.

No Snoop

Select Enable to support no-snoop mode for each CB device. The options are **Disable** and Enable.

Disable TPH

Select Enable to de-activate TLP Processing Hint support. The options are **Disable** and Enable.

▶ II0 Generation Configuration

The following information will display:

TXT DPR memory setting

Use this item to set TXT DPR settings. The options are 1M DPR, **3M DPR**, 64M DPR, 128M DPR, and 255M DPR.

Unhide QPI PMU Counter

Select Enable to use the PCI-Express counters. Select Disable to hide the PCI-Express counters. The options are **Disable** and 255M Enable.

IIO0/IIO1/IIO2/IIO3

II0 IOAPCI

Select Enable to support IIO IOAPIC (I/O Advanced Power Interface Configuration). The options are **Enable** and Disable.

▶ Intel VT for Directed I/O (VT-d)

Intel VT for Direct I/O (VT-d)

Isoc

Select Enable to enable Isochronous support to meet QoS (Quality of Service) requirements. This feature is especially important for Intel Virtualization technology. The options are Enable and **Disable**.

VTd (VT-d) Azalea VCp Optimization

Select Enable to enable Intel Virtualization Technology (VT-d) Direct I/O support to optimize Azalea VCp performance. The options are **Disable** and Enable.

Intel® VT for Directed I/O (VT-d)

Select Enable to enable Intel Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to the VMM (Virtual Machine Monitor) through the DMAR ACPI Tables. This feature offers fully-protected I/O resource sharing across Intel platforms, providing greater reliability, security and availability in networking and data-sharing. The options are **Enable** and Disable.

Interrupt Remapping

Select Enable to support Interrupt Remapping to enhance system performance. The options are **Enable** and Disable.

Pass Through DMA

Select Enable for the Non-Iscoh VT-d engine to pass through DMA (Direct Memory Access) to enhance system performance. The options are **Enable** and Disable.

ATS

Select Enable for the Non-Iscoh VT-d engine to pass through ATS to enhance system performance. The options are **Enable** and Disable.

Super Pages

Select Enable for VT-d Super-Pages support to improve system performance. The options are **Enable** and Disable.

Coherence Support

Select Enable for Non-Iscoh VT-d Engine Coherence support to improve system performance. The options are **Disable** and Enable.

PCI Express Global Options

Gen3 (Generation 3) Phase3 Loop Count

Use this feature to set the Loop-Count value for PCI-E Gen3 Phase3 operations. The options are 1, 4, **16**, and 256.

Skip Halt On DMI Degradation

Select Enable to avoid the system being put on hold during DMI width/link degradation. The options are **Disable** and Enable.

Power Down Unused Ports

Select Enable to disable the PCI-E ports that are not active. The options are **Disable**, Enable, HSX Disable

SLD WA Revision

Select Auto for the BIOS to automatically update the SLD WA revision status. The default setting is **Auto**.

▶QPI (Quick Path Interconnect) Configuration

QPI Status

The following information will display:

- Number of CPU
- Number of IIO
- LInk Speed
- Current QPI Link Frequency
- QPI Global MMIO Low Base/Limit
- QPI Global MMIO High Base/Limit
- QPI PCI-E Configuration Base/Siz (Size)

QPI Link Speed Mode

Use this feature to select the data transfer speed for QPI Link connections. The options are **Fast** and Slow.

Current QPI Link Frequency

Use this feature to select the desired frequency for QPI Link connections. The options are 6.4GB/s, 7.2GB/s, 8.0GB/s, **Auto,** and Use Per LInk Setting.

Link L0p Enable

Select Enable for Link L0p support. The options are Enable, **Auto,** and Disable.

Link L1p Enable

Select Enable for Link L1p support. The options are Enable, **Auto,** and Disable.

MMIO P2P Disable

Select No to prevent MMIO (Memory-Mapped I/0) P2P (PCI-E device to PCI-E device) signals from crossing the CPU socket. The options are **No** and Yes.

PPIN Opt-in

Select Yes to use the Protected-Processor Inventory Number (PPIN) in the system. The options are **No** and Yes.

Resource Auto Adjust

Select Enable for the PCI resource-requests for each CPU socket to be automatically adjusted on the need-base when the PCI resource allocator fails. The options are **Enable** and Disable.

▶QPI Per Socket Configuration

▶CPU 0/CPU 1/CPU 2/CPU 3

Bus Resource Allocation Ratio

Use this feature to set the bus resource-allocation ratio (from 0-8). The default setting is **1**.

IO Resource Allocation Ratio

Use this feature to set the IO resource-allocation ratio (from 0-8). The default setting is **1**.

MMIOL Resource Allocation Ratio

Use this feature to set the Memory-Mapped IO resource-allocation ratio (from 0-8). The default setting is **1**.

IIO UniPhy Disable

Select Yes to hide the entire UNIFY in L2 cache. The options are **No**, Yes, and Yes w/Memory Hot Add.

▶Memory Configuration

This section displays the following Integrated Memory Controller (IMC) information.

Promote Warnings

Select Enable to treat memory warnings as memory errors or memory faults for system-level debugging. The options are **Enable** and Disable.

DDR Speed

Use this feature to force a DDR3 memory module to run at a frequency other than what is specified in the specification. The options are **Auto**, 800, 1067, 1333, 1600, 1867, and 2133.

DDR Voltage Level

Select Force to 1.50V to force all DDR3 memory modules to operate at 1.50V. Select Force to 1.35V to force all DDR3 memory modules to operate at 1.35V. The options are **Auto**, Force to 1.50V, and Force to 1.35V.

Advanced Clk (Clock) Training

Select Enable for Advanced Clock Training support, which will allow the memory command line to be synchronized with the clock line to enhance memory performance. The options are **Enable** and Disable.

Perbit (Per-bit) Deskew Training

Select Enable for Perbit Deskew Training support, which will allow the memory controller to include various adjustable delay circuits in both Read and Write paths on a per-bit base for effective memory interface to maximize memory performance. The options are **Disable** and Enable.

DDT Timing Mode

Use this feature to set the DDT (Distributed Debugging Tool) Timing mode for the memory controller to enhance Graphical User Interface (GUI) support. The options are **Aggressive Timing** and Conservative Timing.

MxB Rank Sharing Mapping

Use this feature to select the address-mapping setting for memory-rank sharing to enhance extended multimedia platform performance. he options are **Maximum Performance** and Maximum Margin.

DIMM Vref. (Voltage Reference) Circuit

This feature allows the user to decide how to configure the voltage reference point (gate) for a DDR3 memory module. The options are Internal and **External**.

BIOS VMSE Reset

If this feature is set to Enable, BIOS settings pertaining to the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller will be reset to improve system performance. The options are Disable and **Enable**.

Phase Shedding

Select Enabled to enable Static Phase-Shedding support for DDR3 memory voltage regulators to improve memory performance. The options are **Auto**, Disabled and Enabled.

Multi-Threaded MRC (Memory Reference Code)

Select Enabled for the system to execute multi-threaded memory codes to improve memory performance. The options are **Auto**, Disabled and Enabled.

Rank Multiplication

Select Enabled to force the LRDIMM (Load-Reduced DIMM) memory modules to operate at the Rank-Multiplication mode for memory performance enhancement. The options are **Auto** and Enabled.

LRDIMM (Load-Reduction DIMM) Module Delay

When this item is set to Disabled, the MRC (Memory Regulator Controller) will not use SPD bytes 90-95 for module delay on LRDIMM memory. The options are **Disabled** and Auto.

Memory Type

Use this feature to select the memory type to be used in this system. The options are RDIMMs only, UDIMMs only, and **UDIMMs and RDIMMs**.

Rank Margin Tool

Select Enabled to activate the rank-margin tool for DDR3 memory training (memory tuning). The options are **Auto**, Disabled and Enabled.

RMT (Rank Margin Tool) Loop Count

Use this item to set RMT Loop Counter. The options are **Auto**, Disabled and Enabled.

Skip MemTest (Memory Test) on Fast Boot

Select Enabled to skip memory routine testing at bootup if this machine is set to Fast-boot mode. The options are **Auto**, Disabled and Enabled.

Attempt Fast Boot

Select Enabled to skip a portion of memory code testing to speed up system boot. The options are **Disabled** and Enabled.

BDAT

Select Enabled for BDAT (Binary Data Advanced Technology) support to increase system performance. The options are **Disabled** and Enabled.

Data Scrambling

Select Enabled to enable data scrambling to enhance system performance and data integrity. The options are Disabled and **Enabled**.

Scrambling Speed Low

Use this feature to set the data scrambling speed to low-32 bits. Enter a value between 0 and 32. The default setting is **0**.

Scrambling Speed High

Use this feature to set the data scrambling speed to high-32 bits. Enter a value between 0 and 32. The default setting is **0**.

Enable ADR

Select Enabled for ADR (Automatic Diagnostic Repository) support to enhance memory performance. The options are Enabled and **Disabled**.

VMSE Lockstep Mode

Select Enabled to support the VMSE Lockstep mode, which will support Lock step mode for the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller. The options are **2:1 Mode**.

NB Persistent Error

Select Enable to allow the system to properly handle the persistent errors occurred in the North Bridge. The options are Enable and **Disable**.

SB Persistent Error

Select Enable to allow the system to properly handle the persistent errors occurred in the South Bridge. The options are is **Enable** and Disable.

SB Error Threshold

Use this feature to set the threshold for South Bridge errors. When the number of South Bridge errors reaches beyond the threshold, the system will automatically take corrective actions. The default setting is **10**.

Link Failure Threshold

Use this feature to set the link failure threshold. When the number reaches beyond the threshold, the system will automatically take corrective actions. The default setting is **7**.

HA (Hash Mode) Early Write Post Mode

Select Enable to support memory hash-method-comparison mode when the system is running at the early stage of POST (Power-On-Self-Test). The options are is **Enable** and Disable.

MC Channel Hash Mode

Select Enabled to support the hash-method-comparison mode for the memory controller to improve memory performance. The options are Enabled and **Disabled**.

Unused Memory Channel Input

Select Enabled to allow input from unused memory channels. The options are **Enabled** and Disabled.

VMSE RMT (Rank Margin Tool)

Select Enabled to enable RMT support for the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller to improve memory performance. The options are Enabled and **Disabled**.

VMSE CPGC (Converged Pattern Generation and Checking) Pattern Length

Use this feature to set the CPGC pattern-length for the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller for memory parity-checking. The default setting is **0**.

Command 2 Data Tuning

Select Enabled to fine-tune electrical command paths from the host system to the memory-extension buffer (MXB). The options are **Enabled** and Disabled.

Jordon Creek Power Management

Select Enabled to activate power management features embedded in the Jordon Creek chip for the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller. The options are **Enabled** and Disabled.

MRC Debug Level

Use this feature to set the debugging level for memory reference codes, which are used for memory multiple threads initialization. The options are **L0**, L1 and L2.

Halt on Memory Fatal Error

Select Enabled to put the system on hold when a memory fatal error occurs. The options are **Enabled** and Disabled.

Promote MEM (Memory) Train Err (Error)

Select Enabled to promote warnings when a memory training-error occurs. The options are Enabled and **Disabled**.

Promote MEM (Memory) RAS Warnings

Select Enabled to promote warnings pertaining to RAS (Reliability, Availability, Serviceability) issues. The options are Enabled and **Disabled**.

Memory Test

When this feature is set to Enabled, memory tests will be performed in the system. The options are Enabled and **Disabled**.

JCK (Jordon Creek) per DIMM Parity Error Enable

Select Enabled for the system to monitor and keep track of DIMM parity errors occurred on each DIMM module. The options are Enabled and **Disabled**.

DRAM RAPL (Running Average Power Limit) Mode

Use this feature to set the run-time power-limit mode for DRAM modules. The options are Disabled, **VR Measured** and Estimated.

Closed Loop Thermal Throttling

Select Enabled to support Closed-Loop Thermal Throttling which will improve reliability and reduces CPU power consumption via automatic voltage control while the CPU are in idle states. The options are **Disabled** and Enabled.

Memory Hot Sense Thermal Throttling

Select Enabled to activate thermal-throttling when the hot-sensor reaches the predefined threshold via automatic voltage control when the CPU is in idle states. The options are **Disabled** and Enabled.

Memory Hot Output Thermal Throttling

Select Enabled to provide thermal-throttling warnings when the hot-sensor reaches the predefine threshold via automatic voltage control when the CPU is in idle states. The options are **Disabled** and Enabled.

MC DDT Mode

This feature sets the DDT (Distributed Debugging Tool) mode for the memory controller. The options are **Auto**, 100 Ohms, and 50 Ohms.

MRC (Memory Reference Code) Promote Warnings

Select Enabled for the system to provide MRC warnings to improve memory performance. The options are **Enabled** and Disabled.

Num (Number) of Sparing Transac (Transaction)

Use this feature to set the number of memory sparing transactions that will allow data to be written from a failing component to another component to ensure data security. The options are **4**.

PSMI Support

Select Enabled for Power Supply Management Interface (PSMI) support. The options are Enabled and **Disabled**.

VMSE Clock Stop

Select Enabled to de-activate the clock driver for the Intel Scalable Memory Interconnect 2 (Intel SMI 2) controller. The options are Enabled and **Disabled**.

Safe MC (Micro Code) BGF (Buffer Generation First-in-First-Out) PSV

Select Enabled to use the Micro-Code Safe mode to allow the onboard power control mechanism to supply power to the memory buffer on the on-demand basis in an effort to save power consumption. The options are Enabled and **Disabled**.

▶Memory Topology

This item displays the status of each DIMM module as detected by the BIOS.

- Node
- Channel
- DIMM Frequency

▶Memory RAS (Reliability_Availability_Serviceability) Configuration

Use this submenu to configure the following Memory RAS settings.

Memory RAS Configuration Setup

Socket 0 Branch 0/Socket 0 Branch1/Socket 1 Branch 0/Socket 1 Branch1/Socket 2 Branch 0/Socket 2 Branch1/Socket 3 Branch 0/Socket 3 Branch1/

Select Enable to enable the memory module installed on the socket specified by the user. The default setting is **Enable** and Disable.

Migration Spare

Use this feature to set the bit-mask of the riser card that is designated as a spare riser. The default setting is **0**.

Current Memory Speed

This item displays the current memory speed.

Mirroring

This item indicates if memory mirroring is supported by the motherboard. Memory mirroring creates a duplicate copy of the data stored in the memory to enhance data security.

Sparing

This item indicates if memory sparing is supported by the motherboard. Memory sparing enhances system performance.

Memory Rank Sparing

This item indicates if memory rank sparing is supported by the motherboard. Memory rank sparing enhances system performance.

Spare Error/Memory Correctable Thr (Threshold)

Use this feature to set the correctable error threshold for spare memory modules. The default setting is **32767**.

Leaky Bucket Low Bit

Use this feature to set the Low Bit value for the Leaky Bucket algorithm which is used to check the data transmissions between CPU sockets and the memory controller. The default setting is **40**.

Leaky Bucket High Bit

Use this feature to set the High Bit value for the Leaky Bucket algorithm which is used to check the data transmissions between CPU sockets and the memory controller. The default setting is **41**.

Publish SRAT (Static Resource Affinity Table)

Select Enable for the BIOS to report the ACPI SRAT table to the OS in order to enhance CPU and memory performance when the NUMA (Non-Uniformed Memory Access) is optimized. The options are **Enable** and Disable.

SRAT Memory Hot Plug

If t his item is set to Disable, memory hot-plugging support will be disabled and hot-plugging entries will be removed. This feature is used for the OS that does not support memory hot-plugging. The options are Enable and **Disable.**

SRAT CPU Hot Plug

If t his item is set to Disable, CPU hot-plugging support will be disabled and hot-plugging entries will be removed. This feature is used for the OS that does not support memory hot-plugging. The options are Enable and **Disable**.

SLIT (System Locality Information Table) One Hop Value

Select Enable for the BIOS to build the SLIT table to show the differences between the remote latency ratio and the local latency ratio to further optimize system performance for Linux Kernel 2.6 or later platforms. The default setting is **21**.

Memory Interleaving

Use this feature to set the DIMM memory interleaving mood. The options are NUMA (1-way) Node Interleave, 2-way Node Interleave, 4-way Interleave, 8 Way Interleaving, Inter-socket, and **Auto**.

Socket Interleave Below 4GB

Select Enabled for the memory above the 4G Address space to be split between two sockets. The options are Enable and **Disable**.

Channel Interleaving

Use this feature to set the DIMM channel interleaving mood. The options are **Auto**, 1 Way Interleave, 2 Way Interleave, 3, Way Interleave, and 4 Way Interleave.

Rank Interleaving

Use this feature to select a rank memory interleaving method. The options are **Auto**, 1 Way, 2 Way, 4, Way, and 8 Way.

DRAM Maintenance

Select Auto for the BIOS to automatically configure DRAM Refreshing and Patrol settings. The options are Manual and **Auto**.

pTRR (Pseudo Target Row Refresh) Support

Select Enabled for Pseudo TRR support which will allow the BIOS to assign an invalid address to a questionable memory module to prevent this memory module from being accessed by other components. The options are **Enabled** and Disabled.

Injection Probability

AMEI (Asynchroous MCA Error Injection) (AMEI) is a error-handling mechanism that allows the BIOS to report the MCA errors to the CPU core or the CPU before resuming normal operations. This item is used to set the threshold of the AMEI events beyond which the BIOS will report the error events before resuming operations. The options are 512, 1024, 1365, 1638, 1820, 1928, 2048, 2731, 3277, 3641, **4096**, 5461, 6554, 8192, 10923, 16384, 32768.

Demand Scrub

Demand Scrubbing is a process that allows the CPU to correct correctable memory errors found on a memory module. When the CPU or I/O issues a demand-read command, and the read data from memory turns out to be a correctable error, the error is corrected and sent to the requestor (the original source). Memory is updated as well. Select Enable to use Demand Scrubbing for ECC memory correction. The options are **Enable** and Disable.

Device Tagging

Select Enable to support device tagging. The options are **Disable** and Enable.

Memory Power Management

Select Enabled for memory power management support. The options are **Disabled** and Enabled.

Memory Rank Mask

Select Enabled to support memory rank in the memory controller. The options are **Disabled** and Enabled.

A7 Mode

Select Enabled to support A7 (Addressing) Mode to improve memory performance. The options are **Disable** and Enable.

DDDC Support

Select Enabled to enable Double-Device Data Correction (DDDC) support for the error-correction codes to correct memory errors caused by two failed DRAM devices. The options are **Disable** and Enable.

DDDC Wirekill (Wire-Kill)

Select Enabled for Double-Device Data Correction (DDDC) Wire-kill support which will disable the wire connection between two DRAM devices when they fail. The options are **Disable** and Enable.

DDDC Wirekill (Wire-Kill) Threshold

Use this feature to set the DDDC Wirekill threshold. When the memory errors reach the threshold,wire-connections between the failed DRAM modules will be disconnected. The options are **Disable** and Enable.

Apply Memory RAS (Reliability-Availability-Serviceability Policy Globally

When this item is set to Enabled, the configuration settings for memory sparing, Mirroring, DDDC, Device-Tagging will be applied to all nodes in the system. The options are **Disable** and Enable.

Memory Mirroring

Select Enable to enable memory-mirroring support which will create a duplicate copy of the data stored in the memory to enhance data security. The options are **Disable** and Enable.

▶South Bridge

This feature is used to configure Intel South Bridge settings.

▶USB Configuration

The following USB items will display.

- USB Module Version
- USB Devices

Legacy USB Support (Available when USB Functions is not Disabled)

Select Enabled to support legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disabled to have USB devices available for EFI (Extensive Firmware Interface) applications only. The settings are Disabled, **Enabled** and Auto.

USB 3.0 Support

Select Enabled for USB 3.0 support. The options are Disabled and **Enabled**.

XHCI Hand-Off

This feature is a work-around solution for operating systems that do not support XHCI (Extensible Host Controller Interface) hand-off. The XHCI ownership change should be claimed by the XHCI driver. The settings are **Enabled** and Disabled.

EHCI Hand-Off

This item is for operating systems that do not support Enhanced Host Controller Interface (EHCI) hand-off. When this item is enabled, EHCI ownership change will be claimed by the EHCI driver. The settings are Enabled and **Disabled**.

USB Mass Storage Driver Support

Select Enabled for USB mass storage device support. The options are Disabled and **Enabled**.

Port 60/64 Emulation

Select Enabled for I/O port 60h/64h emulation support which will provide complete USB keyboard legacy support for the operating system that does not support Legacy USB devices. The options are Disabled and **Enabled**.

USB Hardware Delays and Time-outs

U**SB Transfer Time-out**

Use this feature sets the USB Transfer Time-out values for control, bulk, and interrupt transfers. The default setting is **20 sec (seconds)**.

Device Reset Time-out

Select Auto for the BIOS to automatically configure the delay maximum time setting before a USB device properly reports itself to the system. The options are **Auto** and Manual.

Device Power-up Delay

Use this feature sets the maximum time-out value for initialization of USB mass storage devices. The options are 10 Sec, **20 sec**, 30 Sec, and 40 Sec (seconds).

▶SATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the SATA Devices and displays the following items:

SATA Controllers

This item enables or disables the built-in SATA controllers on the motherboard. The options are **Enabled** and Disabled.

Configure SATA As

Use this feature to configure the SATA mode for a devices installed in the SATA port specified by the user. The options are IDE, **AHCI** and RAID.

▶Software Feature Mask Configuration

Low Power Device Detection Support

Select Enabled for the low-power device to be detected by the BIOS. The options are **E**nabled and **Disabled**.

Aggressive LPM Support

Select Enabled for the PCH chip to aggressively enter the Link-Power state. The options are **Enabled** and Disabled.

Alternate ID (Available when RAID is selected in the item above-"Configure SATA as")

Select Enabled for the port specified by the user to report an alternate ID to the system. The options are **Enabled** and Disabled.

SATA Port 0/SATA Port 1/SATA Port 2/SATA Port 3/SATA Port 4/SATA Port 5

This section allows the user to configure the following settings for the SATA port specified by the user.

Software Preserve

Port 0/Port 1/Port 2/Port 3/Port 4/Port 5

Select Enabled to enable the port specified by the user. The options are **Enabled** and Disabled.

Hot Plug (Available when AHCI or RAID is selected in the item above-"Configure SATA as")

Select Enabled to support Hot-plugging for the selected SATA port which will allow the user to replace a device without shutting down the system. The options are Enabled and **Disabled.**

Port Multiplier (Available when AHCI or RAID is selected in the item above-"Configure SATA as")

Select Enabled to support port-multiplier for the SATA port specified by the user. The options are Enabled and **Disabled.**

Spin Up Device (Available when AHCI or RAID is selected in the item above-"Configure SATA as")

Select Enabled to allow the PCH to start a COMRESET initialization (from 0 to 1 on an edge detect) to the device. The options are Enabled and **Disabled**.

SATA Device Type

Use this feature to configure the SATA device type for the device installed on selected a SATA port for use of IDE mode, RAID mode or AHCI mode. The options are Solid State Device and **Hard Disk Drive**.

▶PCIe/PCI/PnP Configuration

PCI Latency Timer

Use this feature to set the latency timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are **32**, 64, 96, 128, 160, 192, 224 and 248 (PCI Bus Clocks).

VGA Palette Snoop

Select Enabled to support VGA palette register snooping which will allow the PCI cards that do not contain their own VGA color palette to examine the video cards palette and mimic it for proper color display. The options are **Disabled** and Enabled.

PERR# Generation

Select Enabled to allow a PCI device to generate a PERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

SERR# Generation

Select Enabled to allow a PCI device to generate an SERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

Maximum Payload

Select Auto to allow the system BIOS to automatically set the maximum payload value for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes and 256 Bytes.

Maximum Read Request

Select Auto to allow the system BIOS to automatically set the maximum Read Request size for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

ASPM Support

This feature allows the user to set the Active State Power Management (ASPM) level for a PCI-E device. Select Force L0s to force all PCI-E links to operate at L0s state. Select Auto to allow the system BIOS to automatically set the ASPM level for the system. Select Disabled to disable ASPM support. The options are **Disabled**, Force L0s, and Auto.

Warning: Enabling ASPM support may cause some PCI-E devices to fail!

Above 4G Decoding (Available if the system supports 64-bit PCI decoding)

Select Enabled to decode a PCI device that supports 64-bit in the space above 4G Address. The options are Enabled and **Disabled**.

CPU1 Slot 1 PCI-E 3.0 x8 OPROM/CPU1 Slot 2 PCI-E 3.0 x16 OPROM/CPU2 Slot 3 PCI-E 3.0 x8 OPROM/CPU2 Slot 4 PCI-E 3.0 x16 OPROM/CPU2 Slot 5 PCI-E 3.0 x8 OPROM/CPU3 Slot 6 PCI-E 3.0 x8 OPROM/CPU3 Slot 7 PCI-E 3.0 x8 OPROM/CPU4 Slot 8 PCI-E 3.0 x8 OPROM/CPU3 Slot 9 PCI-E 3.0 x16 OPROM/CPU4 Slot 10 PCI-E 3.0 x8 OPROM/CPU4 Slot 11 PCI-E 3.0 x16 OPROM

Select Enabled to enable Option ROM support to boot the computer using a device installed on the slot specified by the user. The options are **Enabled** and Disabled.

Launch Video OPROM Policy

This feature controls how the system executes UEFI (Unified Extensible Firmware Interface), and legacy storage OPROM. Select Legacy Only to boot the system using a legacy device installed in a PCI slot. The options are Do not launch, UEFI Only, Legacy Only, **Legacy first**, and **UEFI first**.

VGA Priority

This feature allows the user to select the graphics adapter to be used as the primary boot device. The options are **Onboard** and Offboard.

Onboard LAN OpROM (Option ROM) Select

Select iSCSI to use the iSCSI Option ROM to boot the computer using a iSCSI network device. Select PXE (Preboot Execution Environment) to use an PXE Option ROM to boot the computer using a PXE network device. The options are iSCSI and **PXE**.

Load Onboard LAN1 Option ROM, Load Onboard LAN2 Option ROM

Select Enabled to enable the onboard LAN1/LAN2 Option ROM. This is to boot the computer using a network device. The default setting for LAN1 Option ROM is **Enabled**, and the default setting for LAN2 Option ROM is **Disabled**.

▶ME (Management Engine) Subsystem

This feature displays the following ME Subsystem Configuration settings.

General ME Configuration

- Operational Firmware Version
- Recovery Firmware Version
- ME Firmware Features
- ME Firmware Status #1
- ME Firmware Status #2

- Current State
- Error Code

▶ACPI Settings

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

Enable ACPI Auto Configuration

Select Enabled to allow BIOS to automatically configure ACPI settings. The options are Enabled and **Disabled**.

Enable Hibernation

Select Enabled to support system hibernation which will allow the system to enter the hibernation state (OS/S4 Sleep) state. This feature may not work well with some operating systems. The options are **Enabled** and Disabled.

ACPI Sleep State

Use this feature to select the ACPI State when the system is in sleep mode. Select S1 (CPU Stop Clock) to erase all CPU caches and stop executing instructions. Power to the CPU(s) and RAM is maintained, but RAM is refreshed. Select Suspend Disabled to use power-reduced mode. Power will only be supplied to limited components (such as RAMs) to maintain the most critical functions of the system. The options are **S1 (CPU Stop Clock)** and Suspend Disabled.

Lock Legacy Resources

Select Enabled to lock resources of legacy devices. The options are **Disabled** and Enabled.

▶Super IO Configuration

Super IO Chip: This item displays the Super IO chip used in the motherboard.

▶Serial Port 0 Configuration

Serial Port

Select Enabled to enable a serial port specified by the user. The options are **Enabled** and Disabled.

Device Settings

This item displays the settings of Serial Port 1 (COM).

Change Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 (COM). Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The options are **Auto**, IO=3F8h; IRQ=4; IO=3F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=2E8h; IRQ=IRQ=3, 4, 5, 6, 7, 10, 11, 12.

Device Mode

Use this feature to select the desired mode for a serial port specified. The options are **24MHz/13** and 24MHz.

▶Serial Port 1 Configuration

Serial Port

Select Enabled to enable a serial port specified by the user. The options are **Enabled** and Disabled.

Device Settings

This item displays the settings of Serial Port 1.

Change Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 2 (SOL). Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The options are **Auto**, O=2F8h; IRQ=3; IO=3F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=2F8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=3E8h; IRQ=3, 4, 5, 6, 7, 10, 11, 12; IO=2E8h; IRQ=IRQ=3, 4, 5, 6, 7, 10, 11, 12.

Device Mode

Use this feature to select the desired mode for a serial port specified. The options are **24MHz/13** and 24MHz.

Serial Port 2 Attribute

Use this feature to select the attribute for this serial port. The options are **COM/SOL** (Serial On LAN), and COM.

▶COM1 Console Redirection

COM 1 Console Redirection

This submenu allows the user to configure the following Console Redirection settings for this port.

Console Redirection

Select Enabled for Console Redirection support. The options are Enabled and **Disabled**.

COM2/SOL Console Redirection

This submenu allows the user to configure the following Console Redirection settings for the SOL Port specified by the user.

Console Redirection

Select Enabled to use the SOL Port for Console Redirection. The options are **Enabled** and Disabled.

▶Console Redirection Settings

This feature allows the user to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

Terminal Type

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, **VT100+**, and VT-UTF8.

Bits Per second

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600 and **115200** (bits per second).

Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 Bits and **8 Bits**.

Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits

is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark and Space.

Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and 2.

Flow Control

This feature allows the user to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are **Enabled** and Disabled**.**

Recorder Mode

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

Legacy OS Redirection Resolution

Use this feature to select the number of rows and columns used in Console Redirection for legacy OS support. The options are 80x24 and **80x25**.

Putty KeyPad

This feature selects Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SCO, ESCN, and VT400.

Redirection After BIOS Post

Use this feature to enable or disable legacy console redirection after BIOS POST. When set to Bootloader, legacy console redirection is disabled before booting

the OS. When set to Always Enable, legacy console redirection remains enabled when booting the OS. The options are **Always Enable** and Bootloader.

Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

The submenu allows the user to configure Console Redirection settings to support Out-of-Band Serial Port management.

Console Redirection (for EMS)

Select Enabled to use a COM Port selected by the user for Console Redirection. The options are **Enabled** and Disabled.

▶Console Redirection Settings (for EMS)

This feature allows the user to specify how the host computer will exchange data with the client computer, which is the remote computer used by the user.

Out-of-Band Management Port

The feature selects a serial port used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote server. The options are **COM1 Console Redirection** and COM2/SOL Console Redirection.

Terminal Type

This feature allows the user to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100+ to add color and function key support. Select ANSI to use the extended ASCII character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are ANSI, VT100, VT100+, and **VT-UTF8**.

Bits Per Second

This item sets the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 57600, and **115200** (bits per second).

Flow Control

This feature allows the user to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None,** Hardware RTS/CTS, and Software Xon/Xoff.

The setting for each these features is displayed:

Data Bits, Parity, Stop Bits

▶Trusted Computing (Available when a TPM device is detected by the BIOS)

Configuration

Security Device Support

Select Enabled on this item and enable the TPM jumper on the motherboard to enable onboard security devices to improve data integrity and network security. The options are **Enabled** and Disabled.

TPM (Trusted-Platform Module) State

Select Enabled to enable TPM security settings to improve data integrity and network security. The options are Disabled and **Enabled**.

Pending Operation

Use this item to schedule an operation for the security device. The options are **None**, Enable Take Ownership, Disable Take Ownership, and TPM Clear.

Note: The computer will reboot in order to execute the pending commands and change the state of the security device.

Current Status Information: This item displays the information regarding the current TPM status.

TPM Enable Status

This item displays the status of TPM Support to indicate if TPM is currently enabled or disabled.

TPM Active Status

This item displays the status of TPM Support to indicate if TPM is currently active or deactivated.

TPM Owner Status

This item displays the status of TPM Ownership.

▶iSCSI Configuration

This item displays iSCSI configuration information:

iSCSI Initiator Name

This item displays the name of the iSCSI Initiator, which is a unique name used in the world. The name must use IQN format. The following actions can also be performed:

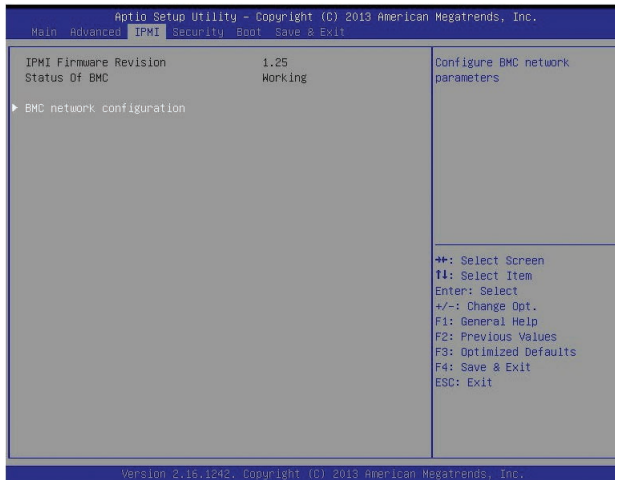
▶Add an Attempt

▶Delete Attempts

▶Change Attempt Order

4-3 IPMI

Select the IPMI (Intelligent Platform Management Interface) tab to access the following submenu items.



These items indicates your system IPMI firmware revision number and status.

- IPMI Firmware Revision
- IPMI Status

▶BMC Network Configuration

LAN Channel 1: This feature allows the user to configure the settings for LAN1 Port.

Configuration Address Source

This feature allows the user to select the source of the IP address for this computer. If Static is selected, you will need to know the IP address of this computer and enter it to the system manually in the field. If DHCP is selected, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network that is attached to and request the next available IP address for this computer. The options

are **DHCP** and Static. The following items are assigned IP addresses automatically if DHCP is selected, or can be configured manually if Static is selected.

Station IP Address

This item displays the Station IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

Subnet Mask

This item displays the sub-network that this computer belongs to. The value of each three-digit number separated by dots should not exceed 255.

Station MAC Address

This item displays the Station MAC address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.

Router IP Address

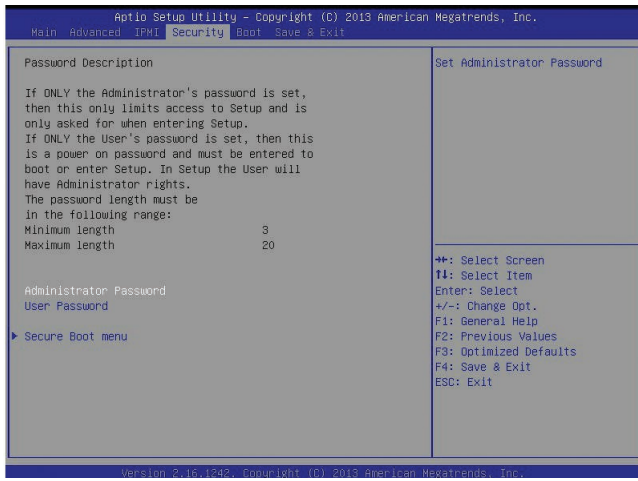
This item displays the Router IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

Router MAC Address

This item displays the Router MAC address for this computer.

4-4 Security

This menu allows the user to configure the following security settings for the system.



Administrator Password

Use this feature to set the administrator password which is required to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

User Password

Use this feature to set a user password which is required to log into the system and to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

▶Secure Boot Menu

The following items will display:

- System Mode
- Secure Boot

Secure Boot Support

Select Enable for Secure Boot support to ensure system security at bootup. The options are Enabled and **Disabled**.

Secure Boot Mode

This feature allows the user to select the desired Secure Boot mode for the system. The options are Standard and **Custom**.

▶Key Management

Default Keys Provision

Select Enable to install all manufacture defaults for the following system security settings. The options are **Disabled** and Enabled.

▶Enroll All Factory Default Keys

This feature allows the user to install all factory-security default keys in your system.

Platform Key (PK)

▶Delete PK (Platform key)

Select <Yes> to confirm deletion of the Platform Key from the NVRAM (Non-Volatile RAM)..

▶Set New PK (Platform Key)

Select <Yes> to load default factory platform keys to your system. Select No to load the default settings from other sources.

Key Exchange Key Database (KEK)

▶Delete KEK (Key Exchange Key)

Select <Yes> to confirm deletion of the KEK from the NVRAM (Non-Volatile RAM).

▶Set New KEK (Key Exchange Key)

Select <Yes> to confirm that a new KEK will be set in the NVRAM (Non-Volatile RAM).

▶Append KEK (Key Exchange Key)

Select <Yes> to load the new KEK from the manufacture defaults. Select <No> to load the new KEK from other sources.

Authorized Signature Database (DB)

▶Delete DB (DataBase)

Select <Yes> to confirm deletion of a database from the NVRAM (Non-Volatile RAM).

▶Set New DB (DataBase)

Select <Yes> to confirm that a new database will be set in the NVRAM (Non-Volatile RAM).

▶Append DB (DataBase)

Select <Yes> to load the new database from the manufacture defaults. Select <No> to load the new database from other sources.

Forbidden Signature Database (DBX)

▶Delete DBX

Select <Yes> to confirm deletion of the DBX files from the Non-Volatile RAM (NVRAM).

▶Set New DBX

Select <Yes> to confirm that the new DBX files will be downloaded to the Non-Volatile RAM (NVRAM).

▶Append DBX (DataBase Timer)

Select <Yes> to load the new DBX files from the manufacture defaults. Select <No> to load the new DBX files from other sources.

▶Image Execution Policy

Internal FA

Select Always Execute for the BIOS to always execute Image-Execution Policy commands on each device path when system security is compromised. The default setting is **Always Execute**.

Option ROM

Select Deny Execute to prevent the BIOS from executing Option ROM commands to boot up a system from a network device when system security is compromised. The options are Always Execute, Always Deny, Allow Execute, Defer Execute, **Deny Execute** and Query User.

Removable Media

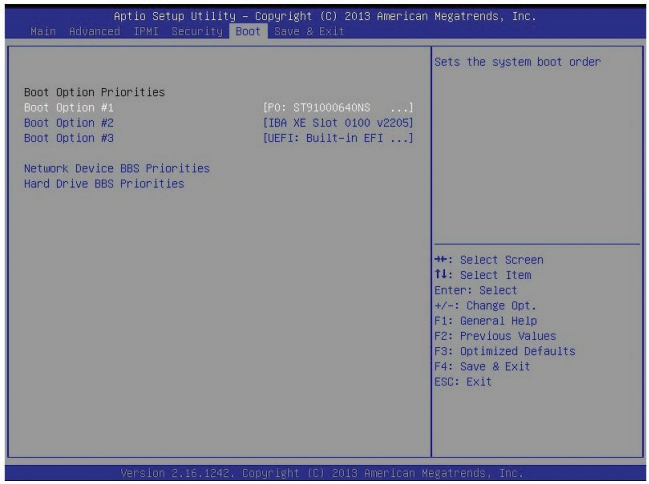
Select Deny Execute to prevent the BIOS from executing critical system commands issued by a removable device when system security is compromised. The options are Always Execute, Always Deny, Allow Execute, Defer Execute, **Deny Execute** and Query User.

Fixed Media

Select Deny Execute to prevent the BIOS from executing critical system commands issued by a fixed media device when system security is compromised. The options are Always Execute, Always Deny, Allow Execute, Defer Execute, **Deny Execute** and Query User.

4-5 Boot

This submenu allows the user to configure the following boot settings for the system.



Set Boot Priority

This option prioritizes the order of bootable devices that the system to boot from. Press [ENTER] on each entry from top to bottom to select devices.

- Boot Order #1
- Boot Order #2
- Boot Order #3
- Boot Order #4
- Boot Order #5
- Boot Order #6
- Boot Order #7
- Boot Order #8
- Boot Order #9

▶CD/DVD ROM Drive BBS Priorities (Available when a device is installed in this drive)

- Boot Order #1

▶Hard Disk Drive BBS Priorities (Available when a device is installed in this drive)

- Boot Order #1

▶USB Hard Disk Drive BBS Priorities (Available when a device is installed in this drive)

- Boot Order #1

▶Network Device BBS Priorities

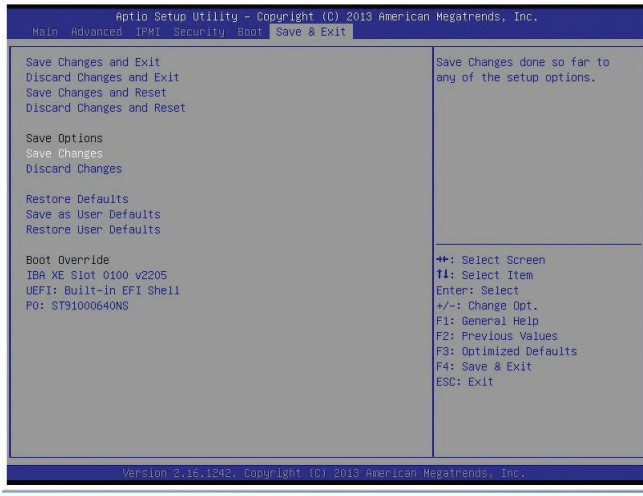
- Boot Order #1

▶UEFI Boot Drive BBS Priorities

- Boot Order #1

4-8 Save & Exit

This submenu allows the user to configure the Save and Exit settings for the system.



Save Changes and Exit

When completing the system configuration changes, select this option to save the changes and exit from the BIOS setup utility. When a dialog box appears, asking you if you want to save configuration and exit, select Yes to save the changes and exit from the BIOS setup utility.

Discard Changes and Exit

Select this option to quit the BIOS setup without making any changes to the system configuration. Select Discard Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, select **Yes** to quit BIOS without saving the changes.

Save Changes and Reset

When completing the system configuration changes, select this option to save the changes and reboot the computer so that the new system configuration settings can take effect.

Save Options

Save Changes

Select this option and press <Enter> to save all changes you've made so far and return to the AMI BIOS utility. When the dialog box appears, asking you if you want

to save configuration, select **Yes** to save the changes, or select No to return to the BIOS without making changes.

Discard Changes

Select this feature and press <Enter> to discard all the changes and return to the BIOS setup. When the dialog box appears, asking you if you want to load previous values, select **Yes** to load the values previous saved, or select No to keep the changes you've made so far.

Restore Optimized Defaults

Select this feature and press <Enter> to load the optimized default settings that help optimize system performance. When the dialog box appears, asking you if you want to load optimized defaults, select **Yes** to load the optimized default settings, or select No to abandon optimized defaults.

Save as User Defaults

Select this feature and press <Enter> to save the current settings as the user's defaults. When the dialog box appears, asking you if you want to save values as user's defaults, select **Yes** to save the current values as user's default settings, or select No to keep the defaults previously saved as the user's defaults.

Restore User Defaults

Select this feature and press <Enter> to load the user's defaults previously saved in the system. When the dialog box appears, asking you if you want to restore user's defaults, select **Yes** to restore the user's defaults previously saved in the system, or select No to abandon the user's defaults that were previously saved.

Boot Override

This feature allows the user to override the Boot Option Priority sequence set in the Boot menu, and boot the system with one of the listed devices instead. This is a one-time override.

- IBA XE Slot 0100 v2205
- UEFI: Built-in EFI Shell
- P0: ST91000640NS

Notes

Appendix A

BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the bootup process. The error messages normally appear on the screen.

Fatal errors will not allow the system to continue to bootup. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list correspond to the number of beeps for the corresponding error.

A-1 BIOS Error Beep Codes

BIOS Error Beep Codes		
Beep Code/LED	**Error Message**	**Description**
1 beep	Refresh	Ready to boot
5 short beeps + 1 long beep	Memory error	No memory detected in the system
5 beeps	No Con-In or No Con-Out devices	Con-In: USB or PS/2 keyboard, PCI or Serial Console Redirection, IPMI KVM or SOL Con-Out: Video Controller, PCI or Serial Console Redirection, IPMI SOL
X9 IPMI Error Codes		
1 Continuous Beep	System OH	System Overheat

Notes

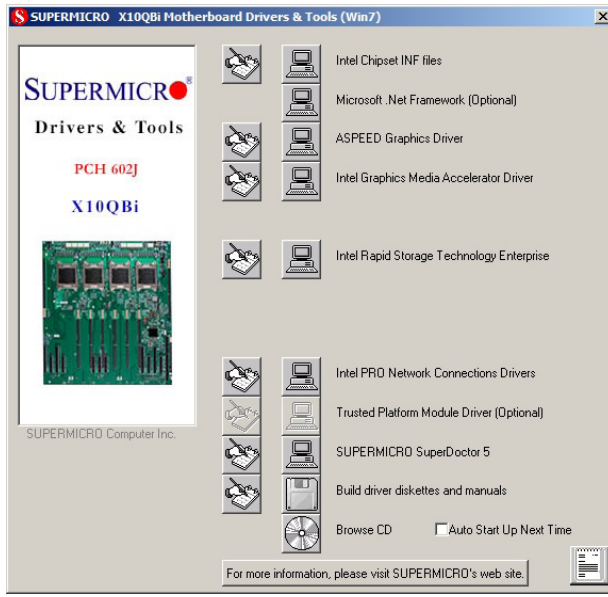
Appendix B

Software Installation Instructions

B-1 Installing Software Programs

After you have installed the operating system, a screen as shown below will appear. You are ready to install software programs and drivers that have not yet been installed. To install these programs, click the icons to the right of these items.

Note: To install the Windows OS, please refer to the instructions posted on our website at http://www.supermicro.com/support/manuals/.



Driver/Tool Installation Display Screen

Note 1. Click the icons showing a hand writing on the paper to view the readme files for each item. Click on a computer icon to the right of an item to install this item (from top to bottom), one at a time. After installing each item, you must reboot the system before proceeding with the next item on the list. The bottom icon with a CD on it allows you to view the entire contents of the CD.

Note 2. When making a storage driver diskette by booting into a driver CD, please set the SATA configuration to "Compatible Mode" and configure the SATA as an IDE in the BIOS Setup. After making the driver diskette, be sure to change the SATA settings back to your original settings.

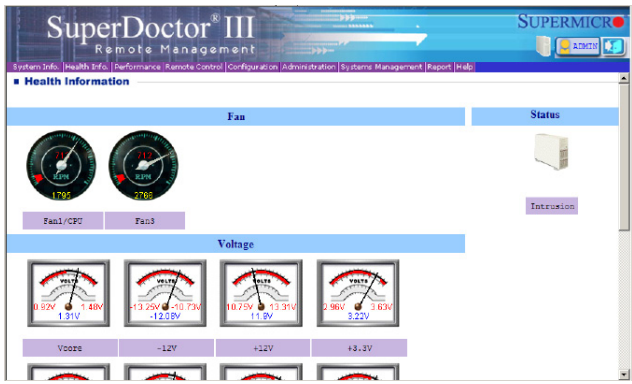
B-2 Configuring SuperDoctor III

The SuperDoctor® III program is a Web-based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called the SD III Client. The SuperDoctor III program included on the CD_ROM that came with your system motherboard allows you to monitor the environment and operations of your system. SuperDoctor III displays crucial system information such as CPU temperature, system voltages, and fan status. Refer to the figure below for a display of the SuperDoctor III interface.

Note: 1 The default user_name and password are ADMIN.

Note 2: In the Windows OS environment, the SuperDoctor III settings take precedence over the BIOS settings. When first installed, SuperDoctor III adopts the temperature threshold settings previously set in the BIOS. Any subsequent changes to these thresholds must be made within SuperDoctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in the BIOS.

SuperDoctor III Interface Display Screen-I (Health Information)



SuperDoctor III Interface Display Screen-II (Remote Control)

Note: SD III software and the user's manual can be downloaded from our website at: http://www.supermicro.com/products/accessories/software/SuperDoctorIII.cfm. For Linux, we will recommend that you use SuperDoctor II.

Notes

Appendix C

UEFI BIOS Recovery Instructions

Warning: Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS may cause irreparable damage to the system. In no event will Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you need to update the BIOS, do not shut down or reset the system while the BIOS is updating to avoid possible boot failure.

C-1 An Overview to the UEFI BIOS

The Unified Extensible Firmware Interface (UEFI) specification provides a software-based interface between the operating system and the platform firmware in the pre-boot environment. The UEFI specification supports an architecture-independent mechanism for add-on card initialization to allow the UEFI OS loader, which is stored in the add-on card, to boot up the system. UEFI offers a clean, hands-off control to a computer system at bootup.

C-2 How to Recover the UEFI BIOS Image (-the Main BIOS Block)

A UEF BIOS flash chip consists of a recovery BIOS block, comprised of two boot blocks and a main BIOS block (a main BIOS image). The boot block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a new BIOS image if the original main BIOS image is corrupted. When the system power is on, the boot-block codes execute first. Once that is completed, the main BIOS code will continue with system initialization and bootup.

Note: Follow the BIOS Recovery instructions below for BIOS recovery if the main BIOS boot crashes. However, if the BIOS boot block crashes, you will need to follow the procedures in Appendix D.

C-3 How to Recover the Main BIOS Block Using a USB-Attached Device

This feature allows the user to recover a BIOS image using a USB-attached device without additional utilities used. A USB flash device such as a USB Flash Drive, or a USB CD/DVD_ROM/RW device can be used for this purpose. However, a USB hard-disk drive cannot be used for BIOS recovery at this time.

To perform a UEFI BIOS recovery using a USB-attached device, follow the instructions below.

1. Using a different machine, copy the "Super.ROM" binary image file into the disc Root "\" Directory of a USB device or writeable CD/DVD.

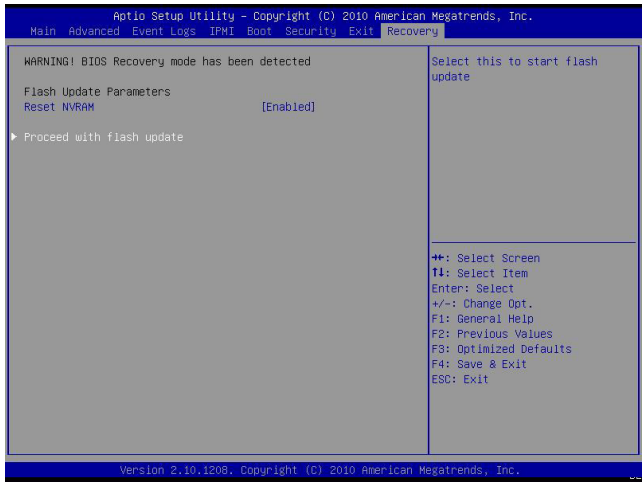
   Note: If you cannot locate the "Super.ROM" file in your driver disk, visit our website at http://www.supermicro.com to download the BIOS image into a USB flash device and rename it "Super ROM" for BIOS recovery use.

2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB drive and power on the system

3. While powering on the system, keep pressing <Ctrl> and <Home> simultaneously on your keyboard until your hear two short beeps. This may take from a few seconds to one minute.

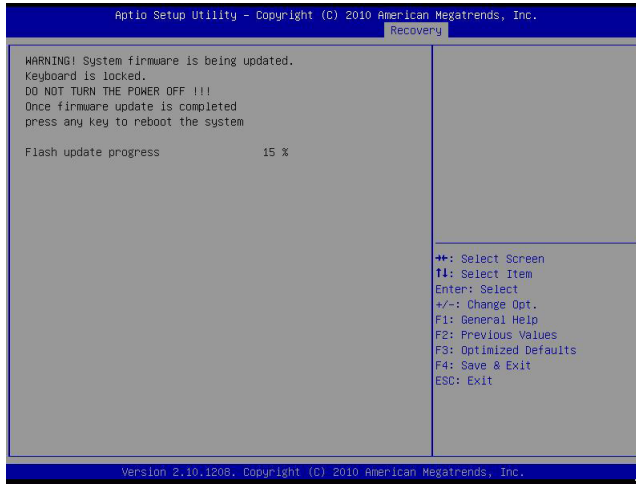
4. After locating the new BIOS binary image, the system will enter the BIOS Recovery menu as shown below.

   Note: At this point, you may decide if you want to proceed with BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.

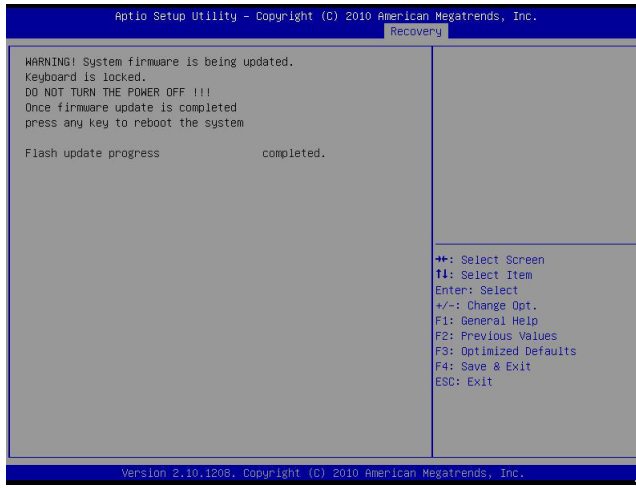


5. When the screen as shown above displays, using the arrow key, select the item- "Proceed with flash update" and press the <Enter> keys. You will see the progress of BIOS recovery as shown in the screen below.

   Note: *Do not interrupt* the process of BIOS flashing until it is completed.



6. After the process of BIOS recovery is complete, press any key to reboot the system.



7. Using a different system, extract the BIOS package into a bootable USB flash drive.

8. When a DOS prompt appears, enter AMI.BAT BIOSname.### at the prompt.

Note: *Do not interrupt this process* until BIOS flashing is completed.

9. After the BIOS update is completed, unplug the AC power cable from the power supply to clear the CMOS, and then plug the AC power cable into the power supply and power on the system.

10. Press <Del> continuously to enter the BIOS Setup utility.

11. Press <F3> to load the default settings.

12. After loading the default settings, press <F4> to save the settings and exit the BIOS Setup utility.

Appendix D

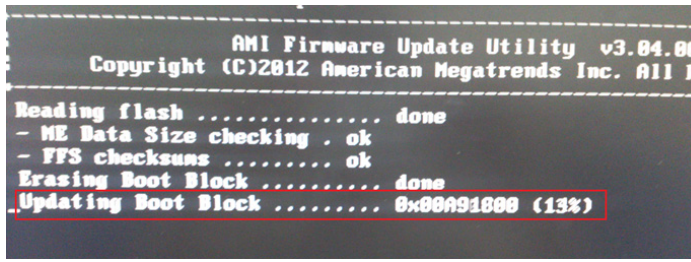
Dual Boot Block

D-1 Introduction

This motherboard supports the Dual Boot Block feature, which is the last-ditch mechanism to recover the BIOS boot block. This section provides an introduction to the feature.

BIOS Boot Block

A BIOS boot block is the minimum BIOS loader required to enable necessary hardware components for the BIOS crisis recovery flash used to update the main BIOS block. An on-call BIOS boot-block corruption may occur due to a software tool issue (see the image below) or an unexpected power outage during BIOS updates.



BIOS Boot Block Corruption Occurrence

When a BIOS boot block is corrupted due to an unexpected power outage or a software tool malfunctioning during BIOS updates, you can still reboot the system by closing pins 2 and 3 using a cap on Jumper JBR1. When JBR1 is set to pins 2 and 3, the system will boot from a backup boot block pre-loaded in the BIOS by the manufacturer.

D-2 Steps to Reboot the System by Using Jumper JBR1

1. Power down the system.
2. Close pins 2-3 on Jumper JBR1, and power on the system.
3. Follow the BIOS recovery SOP listed in the previous chapter (Appendix C).
4. After completing the steps above, power down the system.
5. Close pins 1-2 on Jumper JBR1, and power on the system.

(Disclaimer Continued)

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